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Original Articles

The Treatment of Pulmonary Tuberculosis

A Symposium

Although the prevalence of pulmonary tuberculosis is less than it was several decades ago, it nevertheless is still constantly met with by every active practitioner of medicine.

It seemed, therefore, that an expression of opinion by men well known for their experience and skill in the care and treatment of tuberculous patients would be of great interest at this time. For this reason the Editors of the THERAPEUTIC GAZETTE addressed a letter to a number of active practitioners asking them to answer briefly or fully, as they felt inclined, a series of questions designed to cover points in which other specialists and the general practitioner are vitally interested. The drug treatment of tuberculosis may be said to scarcely exist, but the drug treatment of the symptoms is often of great importance. So too it was thought to be of interest to discover the views of those best qualified to speak as to the use and value of tuberculin.

It is of interest to compare the views expressed in the following replies as well as to note the reaction of the authors to the questions. These questions were as follows:

1. What are the medicinal agents most commonly used in active cases of tuberculosis?
2. What are the remedies used mostly in the inactive cases?
3. Is there any drug in your opinion that has real value as a curative agent in pulmonary tuberculosis? If so, please name it.
4. Do you insist upon absolute rest if there is any febrile movement?
5. Do you consider artificial pneumothorax the best means to combat hemoptysis?
6. What do you use most commonly as a drug to control hemoptysis?
7. In what type or types of tuberculosis do you consider the use of tuberculin a useful remedy?
8. If you use it, what kind do you use, and in what beginning dose and how often?
9. Do you use it at all as a diagnostic agent? If so, how?

By Elmer H. Funk, M.D.,

Physician in Charge, Department of Diseases of the Chest, Jefferson Medical College Hospital, Philadelphia.

1. Symptomatic remedies as follows: Hydrochloric acid to aid digestion, camphoric acid for night sweats, bromides for restlessness, laxative at least once a week or oftener if necessary (many patients, as the result of the abundant diet plus rest in bed, are constipated—that is, fail to have a proper evacuation in spite of one movement a day), twice daily mouth-wash and gargle with some such bland solution as normal saline, no cough mixtures unless there is an associated acute bronchitis.

Just a brief word about the treatment of cough. The cough which brings up something is a valuable cough, in that it helps to drain the tuberculous area. The frequent dry, hacking cough is harmful

in that it subjects the lung to excessive movement, which is most undesirable. The patient can control a good deal of his cough if its uselessness is explained. The physician can help by a judicious use of small doses of bromide, and in some instances by small doses of codeine. Bromide and codeine are useful, so to speak, to take the edge off the cough, but in no sense should benumb the cough to the point where expectoration is interfered with.

Generally speaking the less medicines used in the active stage the better, and yet most patients require some symptomatic medication.

2. Same as No. 1. A frequent annoying symptom of the inactive case is the persistence of the cough and expectoration due to associated chronic bronchitis, perhaps a bronchiectasis, etc. In certain of these cases creosote, oil of santal, etc., are of value.

3. None.

4. Yes. The absolute rest to include vocal rest if there is any hoarseness or other evidence of laryngeal lesion.

5 and 6. We have discarded the use of calcium since the studies of Mohler, Halverson and Hawk on patients in the Chest Department demonstrated that there is practically no reduction in the calcium content of the blood in a patient with tuberculosis. I believe that the nitrites do good.

7 and 8. I have practically never used tuberculin to any extent. In a limited experience it has proved very disappointing. I have tried it in cases in which it would seem indicated, namely, in the chronic type which while apparently not getting any worse is not improving, one in which artificial pneumothorax is contraindicated, and one in which it would seem that the whip is necessary to stimulate the reacting forces of the individual to a greater effort to overcome the tuberculous infection. As stated, my experience has been disappointing. Personally, I consider it a useless remedy. If it is ever used I believe that the initial dose should be so small as to be assured of no reaction, and succeeding doses should be increased by such a small increment that reactions are avoided. I do not believe that scientifically or clinically one is ever justified in giving tuberculin with the idea of producing even mild reactions.

9. I practically never use it as a diagnostic agent because many healthy adults react to it; a number of quite sick and obviously tuberculous adults do not react to it. Its use in the Chest Department is limited to children in whom we try to determine a positive or negative reaction as a piece of evidence in the diagnosis. I emphasize piece of evidence, because I do not consider it a verdict as far as tuberculous disease is concerned. I am reminded of the observations, I think, of Armstrong at Framingham, who found a greater number of Italians to react to tuberculin with a lower mortality to tuberculous disease compared to the less frequent reaction in the Irish, who had a higher mortality to the disease. At its best I believe, as stated above, the tuberculin reaction is a bit of evidence and not a verdict.

Reply from Alexius M. Forster, M.D.,

Physician-in-Chief, Cragmor Sanatorium, Colorado Springs, Colorado.

1. I find in looking over the medicines we use at present for active cases of tuberculosis that they consist chiefly of agents directed toward the control of symptoms. The following is practically a complete list:

Dilute nitrohydrochloric acid; tincture of nux vomica with sodium bicarbonate and tincture of gentian compound; calcium carbonate and phosphate; an occasional dose of calomel or blue mass; also an occasional pill containing podophyllin. Where constipation exists, an effort is made to overcome it by attention to diet and by the use of bran and mineral oil.

In the case of cough, occasionally codeine is resorted to, although every effort is made to avoid the use of cough medicine by training the patient and by local applications to the larynx and trachea. For this purpose we use a combination of guaiacol, oil of cassia and menthol in a bland oil. This

solution is injected with an intratracheal syringe. In certain cases with explosive unproductive cough some form of creosote is used, but of course with no idea of any direct curative effect, and always the patient is carefully watched to see that no digestive disturbance occurs.

Calcium chloride is used in cases of tuberculous enteritis with diarrhea.

Salol is occasionally used for intestinal disturbance.

Acetyl salicylic acid or some other coal-tar derivative is occasionally used for the relief of high temperature or extreme discomfort.

On occasions where night sweats do not yield to outdoor treatment, cerium oxalate is used.

2. In inactive as well as active cases, medication is avoided if possible.

3. There is no drug, in my opinion, that has real value as a curative agent in pulmonary tuberculosis.

4. I insist on absolute rest if there is any febrile movement or manifestation of active toxemia.

5. I consider artificial pneumothorax the best means to combat hemoptysis, but do not attempt to use it until other measures have failed to give results.

6. I use some form of opium most commonly in hemoptysis to quiet the anxiety of the patient and to control the cough.

7. I find that I have gradually discontinued the use of tuberculin. I have never used it except in cases free from active symptoms of the disease.

8. See above.

9. As a diagnostic agent, I use tuberculin either subcutaneously or according to the von Pirquet technique.

From H. R. M. Landis, M.D.,

Physician to the Phipps Institute for Tuberculosis and the White Haven Sanatorium, Philadelphia.

1. In regard to the medicinal agents, this is a question which it is difficult to answer, as some men are quite liberal in their use of drugs; others use them very sparingly. Personally, I never use a drug unless it is to alleviate some symptom which at the time may be troublesome. If I can carry the patient along without drugs, I always do so. I suppose undoubtedly that the drugs most frequently in use are those which have in view the alleviation of cough and those used with an idea of decreasing the amount of sputum. There is no drug or drugs that I know of that will give very satisfactory results in either of these events. So far as the cough is concerned, rest is undoubtedly the most efficient remedy for it. Getting rid of the secretion entirely or reducing it in amount is extremely troublesome, and here again I do not know one drug that is uniformly successful. In some cases tincture of iodine given internally seems to be of use. Creosote and its congeners is most frequently used for this purpose.

2. For an inactive case I see no necessity for using drugs except under exactly the same conditions that one might use them in non-tuberculous individuals, namely, to meet some symptomatic indication.

3. I know of no drug that has any curative effect.

4. Rest is an absolute indication in the presence of fever. There can be no deviation from this rule no matter how long it takes.

5. If the hemorrhage is severe and threatens the patient through the loss of blood, artificial pneumothorax is the only agent available that I know of. It is also usually successful in cases of recurring hemorrhage.

6. Of recent years the only drug I use in the control of hemorrhage is atropine sulphate given hypodermically in doses of 1/30 of a grain and repeated once in six hours if needed.

7. Tuberculin is said to be extremely efficacious in certain forms of surgical tuberculosis, notably tuberculosis of the eye. My experience in these cases is limited. Its use in pulmonary cases has never been satisfactorily proved. I should say that it is much less used to-day than ten years ago.

8. I have not used this remedy for several years.

9. I rarely use it as a diagnostic agent.

From E. S. Bullock, M.D.,

Medical Director, New Mexico Cottage Sanatorium, Silver City, New Mexico.

I am very glad indeed to answer the questions propounded in your letter to the best of my ability.

1. As far as my personal experience is concerned, all medicinal agents in tuberculosis, except tuberculin, have been abandoned. We do not use anything else but tuberculin with any idea of influencing the tuberculous process. Symptomatic medication consists in castor oil when needed, and iron for anemia is very important in order to maintain resistance at the very highest point. I have just finished a study of my work extending over twenty years, and the place of tuberculin is absolutely fixed by this study. In Turban 1, or possibly incipient cases, it is not important to use any tuberculin whatever; the results are just as good without it as with it. In fact they follow the same line in a plotted curve. In Turban 2 and 3[1] cases, moderately advanced and far advanced, there seems to be a little something to be said for tuberculin, although the better results of these two classes may be due to the longer stay under tuberculin treatment than without it. A routine of tuberculin properly handled is an advantage in helping to keep patients on the job, and as we all know, length of treatment is the most important desideratum in tuberculosis.

2. We do not use any medication of any kind in active cases.

3. There is no drug which has any curative value in the treatment of tuberculosis, unless you want to make a possible exception of tuberculin.

4. We not only insist upon absolute rest in febrile cases or where there is any febrile movement, but also if there is any evidence of toxemia at all, regardless of fever.

5. Artificial pneumothorax is the only thing that influences hemoptysis, and in serious hemoptysis should always be used if possible.

[1]Turban 1, 2 and 3 are used to designate the first, second, and third stages of pulmonary tuberculosis.

6. There is no drug known that has any control over hemoptysis.

7. I have already answered in No. 1.

8. I use tuberculin B.F. one millionth mg. in the average cases and one hundred-thousandth in the very good cases for beginning doses. Administered twice a week.

9. Tuberculin has very little use as a diagnostic agent, and I have abandoned it for that purpose entirely.

I am enclosing a table which has been extracted from another paper. If you would like to see it previous to its publication, I would be very glad to have you do so. This table that I am sending you shows that standardized treatment known as hygienic dietetics has been proved a most important thing as well as choosing a suitable climatic environment. This table is the analysis of all my cases from 1900 to 1920. It not only shows the value of climate as

Table Showing Results of All Cases Treated at the New Mexico Cottage Sanatorium, Silver City, N. M., from 1900 to 1920.

Patients being divided into two classes: Ideal patients, in whom the temperament and financial conditions favor a good result, and all patients.

	Incipient Minimal or Turban I.		Moderately Advanced or Turban II.		Far Advanced or Turban III.	
	Ideal Patients.	All Patients.	Ideal Patients.	All Patients.	Ideal Patients.	All Patients.
Arrested.....	91%	64%	61%	42%	8%	7%
Quiescent.....	7.5%	16%	17%	30%	23%	25%
Improved.....	0%	7%	4%	9%	10%	18%
Unimproved...	1.5%	8%	1%	3%	6%	5%
Progressive....	0%	3%	13%	10%	34%	32%
Dead.....	0%	0%	4%	2%	19%	11%

Table Showing Results of All Cases at the Trudeau Sanatorium.

	Incipient.	Moderately Advanced.	Far Advanced.
Arrested.....	45.4%	9.9%	0%
Quiescent.....	35.3%	53.8%	20.5%
Active.....	19.3%	36.3%	79.5%

NOTE.—"Active" in the Trudeau statistics includes Improved, Unimproved, Progressive, and Dead.

compared with the Trudeau Sanatorium, for instance, but as well shows what a tremendous thing the proper temperament and financial condition on the patient's side of the game is in getting good results.

From Charles L. Minor, M.D.,

Asheville, N. C.

1. Doubtless you refer to pulmonary tuberculosis. I will so assume. Medical science so far, despite many efforts, has discovered no real specific in pulmonary tuberculosis, though I believe that in cases where iodine, preferably in the form of iodiform, *can* be applied, it is almost a specific. Unfortunately the conditions for this rarely present themselves. There are numerous drugs that are useful to meet symptoms or to improve general conditions, but there is no specific. Creosote was for a long time called a specific; but it is recognized now that not only is it very hard on the stomach, but that its properties are merely those of an anticatarrhal and antiseptic, and that it is very difficult to give with safety to the digestion. Koch's Old Tuberculin might be called a specific, since tuberculous tissues react with inflammation to its injection. But after an extensive use of it for nearly thirty years by many doctors, it is now used to a very small degree by the workers in this line. Its effects are sometimes, it is true, wonderful, but it is hard to tell when it is indicated, and when it will do good.

2. I should say that rest, food, fresh air, training and physical discipline, exercise, which is just as important as rest if the doctor properly understands the indications for it, tonics where they work, anticatarrhal remedies where they agree with the stomach, are the things chiefly used.

3. I know of no such drug, though I at times use various remedies to help me help my patients.

4. I would first state that no specific instructions as to exercise can be made to fit all cases, or take the place of the doctor's brains and judgment; therefore anything I say in the matter is purely tentative, and it would have to be changed to fit the peculiarity of each individual patient. I believe that absolute rest is so valuable, and it is so hard to abuse it, unlike exercise which is often abused, that there has in recent years been a tendency to overdo it. Febrile patients are kept at absolute rest for long periods when they should be gradually and cautiously resuming exercise. Certainly, however, for any doctor with no judgment and no ability to take into consideration all the various factors in any case, it is much better to stick to absolute rest until the temperature does not go above 99°. But experienced men of good judgment will not have to be tied down to any such hard and fast rule, and will at all times allow exercise with great benefit to the patient whose temperature does not reach 99.8°. I am satisfied that with most patients exercise can be safely begun with an afternoon temperature of 99.5° if the first walk is not more than two or three minutes, and increased from one to three minutes daily. With temperature over 100.5° bed rest should be observed, and recumbent outdoor rest with temperature of 99.8°. Rest followed too long, it should not be forgotten, has a bad effect upon the patient's psyche; it tends to develop a neurasthenia, and makes it very difficult for him to again adapt himself to regular life. Temperature alone, however, is never a safe guide in allowing exercise. The pulse, the physical condition of the lungs, the nature of the symptoms, the temperament of the patient, his surroundings, etc., etc., must all be taken into consideration. The tendency to talk as though temperature were the one conditioning factor is much to be regretted. There is no place in medicine where the essential medical quality of judgment is more called for than when the doctor comes to arrange the rest and exercise of his tuberculous patients.

5. There is no "best means" for every case of hemoptysis. They vary immensely and must be met in various ways. Where a hemorrhage is gushing and persistent, or where it continues to occur in goodly amounts threatening to weaken the patient,

and where the lung is not adherent, it is the remedy *par excellence*. Where, however, hemorrhage is small, less than one cup, and not frequent, it can be so well controlled by other means that pneumothorax is neither necessary nor desirable, and should be reserved for the cases of which I have spoken.

6. Every doctor has his favorite remedy; and mine after twenty-five years' experience, and after a fair trial of every method, is the hypodermic injection of large doses, 1/33 to 1/25 of a grain, of atropine sulphate, as first practiced, I believe, by Solly of Colorado Springs, and Babcock of Chicago, for sizeable hemorrhages of at least half a cup or over. It checks bleeding more quickly than anything else. It is the best thing with which to meet the emergency and to give the blood a chance to clot well. But if recurrences persist, other things must be thought of. It must not be repeated under six hours, as it may paralyze the bladder and intestines.

7. In light or moderately advanced cases with no present marked activity, or tendency to spread, which have stood still or even slipped a little—in such cases it is often wonderful in its effects; it will restart progress and bring about arrest. But in the hands of any but the expert, thoroughly experienced in its use, it is a dangerous agent, and unwisely used can wake up trouble. As I said above, we lack any clear indications for its use, which is probably the reason it has been so generally given up. Its suggestive effect upon patients should not be forgotten. This remarkable effect only makes it the more difficult to estimate its real benefit.

8. No hard and fast figures can be given for dosage. I prefer Koch's Old Tuberculin, commonly called O. T. I usually begin with 1/10,000 milligramme up to 1/1000 mg. once or twice weekly, with a close observation of effects. But no one in a few words can possibly correctly explain how to give tuberculin so that one unfamiliar with it can use it safely.

9. I use it less and less in this way. When I do use it so I begin with 1/10 or 2/10 of a milligramme and increase every three days up to 10 mg., jumping from 1 to 3 to 5 to 8 and then 10, and repeat the 10 twice. Some good authorities have gone as high as 20 to 50 mgs. Interpreting the results is very difficult.

Finally I would say that the longer I treat tuberculosis the more I find that the essence of the treatment is psychological. Fresh air, rest, food, exercise, and at times drugs are essential and indispensable, and teaching is absolutely needed, but unless the patient's moral backbone can be built up along with the physical improvement he makes, all the treatment and instruction he gets will do him no good, because he will not have the moral force to make himself live as he should when he goes home. To build character and will-power is therefore the essential point, and the doctor must feel sure that the patient in the future will have the ability to live the right life and turn his back on pleasures which his reason tells him will be harmful; and our results will be good in direct proportion as our patients leave us, not merely physically improved, not only well educated, but so strong that they can be trusted to be their own masters.

From Harry Lee Barnes, M.D.,

Rhode Island State Sanatorium, Wallum Lake, R. I.

1. Rest is the most valuable remedial agent. We use drugs only for symptomatic relief.

2. If inactive, don't know of any.

3. No.

4. Yes.

5. Yes, for serious cases. Slight hemoptysis does not call for it.

6. Amyl nitrite inhalation, but I am doubtful as to its value. Codeine is used in nearly every case to control excessive cough.

7. The value of tuberculin for pulmonary tuberculosis has never been established in my opinion. See my article, *Journal A. M. A.*, Aug. 3, 1912.

8. In extra-pulmonary lesions.

9. Yes, cutaneous (von Pirquet) under five years of age; subcutaneous after five years of age.

From Bertram H. Waters, M.D.,
Physician-in-Chief, Loomis Sanatorium, Loomis, New York.

I prefer, if I may, to answer the questions in a general way rather than specifically and as formulated, and to begin with No. 3.

In my opinion there is no drug that has real value as a curative agent in pulmonary tuberculosis.

The answers to questions 1 and 2 naturally follow here. There are a number of medicinal agents frequently used, often apparently with benefit, for the relief of certain of the symptoms, but I assume that it will be sufficient answer to say that they are such simple remedies as small doses of codeine or heroin, as the active agents of well-established formulæ for the control of cough, dilute hydrochloric acid, essence of pepsin, the simple tonics—usually combinations of iron, quinine, and strychnine—various suitable forms of laxatives, small doses of atropine or agaricin in an attempt, frequently unsuccessful, to control hyperidrosis, and occasionally digitalis as a cardiac tonic. These measures, while often helpful, are of minor importance and perhaps might be dispensed with entirely.

We do consider absolute rest in bed necessary if there is any febrile movement.

We do consider artificial pneumothorax the best means of combating severe hemoptysis. I regard this procedure as a radical one, and having in view always the frequent occurrence of complications and occasionally of unpleasant sequelæ, I do not induce artificial pneumothorax unless it is apparent that pulmonary hemorrhage is not yielding to the usual measures. These are, of course, absolute rest and quiet, the patient flat in bed, and medication as indicated in answer to the following question.

There is no drug which can be said to control hemoptysis. While I have used at times remedies of the fibrin-ferment type such as thromboplastin, I have little confidence in the specific action of any such medication. We have an established routine by which the patient, if much alarmed and difficult to quiet, is given a small dose, 1/6 grain morphine sulphate with 1/150 grain atropine sulphate and 1/100 grain nitroglycerin hypodermically. The nitroglycerin may be repeated in this dosage several times at fairly frequent intervals, and occasionally the vasodilator effect is prolonged by the continued use at regular intervals of sodium nitrite in small doses. When hemorrhage is under control, I like to use for a considerable period of time 10 or 15 grains of calcium lactate with 1 or 2 grains of quinine sulphate. This is administered in capsules after meals.

I feel that I should here confess that I can offer little in defense of this medication beyond the rather vague supposition that in pulmonary tuberculosis there is a reduction of the calcium content of the blood and the alterative effect of quinine, which may be and probably is bacteriostatic. My only defense of this particular medication is that I believe I have seen since I have been using it, as a routine procedure, diminished occurrence of posthemorrhagic pneumonia.

It is difficult to reply specifically to your question 7. I am one of those who feel that the value of tuberculin is still not proven. I certainly believe that in many instances it is misused. It does seem true that those types of patients who have lesions of the rather chronic fibrotic type with no or very little progression, or those patients who have been through the initial stages of active lesions and have finally arrived at such a condition as this, but who do not show any tendency to advance beyond it, being perhaps a little underweight, a little below par in their endurance—those patients, in other words, who just do not get anywhere—are benefited by proper tuberculin treatment. Of course, if you mean to include in your question tuberculosis other than pulmonary, I do believe that tuberculin is of great value and is almost specific when properly administered in tuberculosis of the lymphatic type, especially the glandular and bone form, and in children. It follows from the above that we do use tuberculin in the types of patients indicated and as follows:

Koch's Old Tuberculin (this is concentrated filtered heated broth culture of

virulent tubercle bacilli). The initial subcutaneous dose varies from .000001 (1/1000 mg.) to .00000001 (1/100,000 mg.), usually administered twice a week, preferably in the morning. (For sake of brevity it might be better to write dosage in mgs. as .001 mg. to .00001 mg. with .0001 mg. being the average beginning dose.)

In answer to question 9, we do use tuberculin, also, as a diagnostic agent and in this manner:

The dosage: .1 mg., .3 mg., 1 mg., 3 mg., 10 mg., subcutaneously. Each dose is approximately three times as strong as the previous dose. Over 48 and not more than 72 hours should elapse between each dose. A reaction—fever, rapid pulse, malaise, etc.—indicates infection. The above, plus a focal reaction (râles), would suggest clinical tuberculosis.

Finally, I think I am a little inclined to believe that the fathers in medicine, however little real scientific basis they had, or may now exist for such therapeusis, had some good reason for their use of certain methods of treatment, and that we should not too hastily discard them. Recent observations seem to confirm this point of view with regard to cod-liver oil. Certainly it remains to-day a useful adjuvant. Again, while I agree with what seems to be your opinion that creosote has no specific influence upon the tuberculous process in the lung, I do find it a helpful ingredient of formulæ for inhalants and occasionally of formulæ to be administered by mouth for the control of cough, and a combination of creosote and calcium in the form of salol-coated or keratin-coated tablet or capsule is very helpful in the relief of gastrointestinal symptoms so commonly seen in the course of active pulmonary tuberculosis, and which probably in most cases results from a tuberculous colitis.

I am especially anxious to give you clearly the information for which you have asked, and quite as anxious that the methods of Loomis Sanatorium should be clearly and properly presented. If in either of these respects I have failed, I should be very glad, if you would be good enough to write me, to attempt to state them more concisely and properly.

From W. G. Turnbull, M.D.,

Medical Director of Pennsylvania State Sanatorium for Tuberculosis, Cresson, Pa.

I am enclosing an answer to two of the questions in your questionnaire—the two referring to artificial pneumothorax. My answers to questions one, two and three would be extremely brief. We use no drugs unless they are indicated for the treatment of some complication. The drug that I use the oftenest, and the one that seems to give me the most results in the secondary infections that accompany many of these cases of tuberculosis, is the proprietary drug calcreose. I do not owe the Maltby Company anything, and do not feel that I am called on to advertise their drug, but I have not yet found anything in the Pharmacopœia that will let me get the same results with creosote without upsetting the stomach.

The answer to question four would be that we do insist upon absolute rest, in early cases with febrile movement. In the old chronic fibroid cases we are not so insistent, and make every case a rule to itself.

I have not attempted to answer questions seven, eight, and nine, because I do not know the answer. I have used tuberculin in about three thousand cases, but I cannot convince myself that I got any better results in any type of case than we can get without the tuberculin.

There can be no question in the mind of any one who has seen artificial pneumothorax properly used in suitable hemorrhage cases that it is the one effectual method we have for checking pulmonary hemorrhage. While other remedies appear at times to give favorable results, we are always in doubt whether we are dealing with result or coincidence. Further experience strengthens the belief in coincidence. With pneumothorax, however, the result is uniform and immediate, and leaves no room for doubt. It approximates in result the surgical ligation of a bleeding artery.

It is unfortunate that only a comparatively small proportion of hemorrhage cases are suitable for this treatment.

In two types of cases it should always be considered: first, persistent blood spitting, which though not necessarily alarming has a profoundly depressing influence on the patient; and second, severe hemorrhage at any stage of the disease.

The first limitation in its use in these cases is the necessity of knowing which is the bleeding side; the second, the presence of pleural adhesions.

Fortunately complete compression of the lung is not always necessary for the control of hemorrhage, and brilliant results are often achieved where partial adhesion renders possible a comparatively small injection. Not the least of the advantages of this treatment is the sense of security given the patient by the knowledge that his relief from hemorrhage is due to a definite mechanical condition and not to the evanescent action of drugs or the vagaries of blood-pressure.

The drug treatment of hemoptysis should be limited to those cases not suitable for mechanical treatment, unfortunately many. There are few drugs left in the Pharmacopœia which have not at some time raised the hopes of the enthusiastic, only to be more or less discredited by experience.

Morphine is probably the most useful single drug in severe hemorrhage. Care must be used to avoid overdose with the possible increased danger of inspiration pneumonia. The quieting of fear, restlessness, and excessive cough can be secured better by moderate doses of morphine than in any other way.

Second place in drug treatment probably belongs to a drug which in our modern wisdom we are rather prone to reject, along with the onion poultices and chamomile tea of our grandmothers, viz., common salt. Limitation of intake of fluids, with the administration of from one to two drachms of sodium chloride every three hours, has given more consistent results in this institution than any other drug treatment. If to the salt is added 20 to 30 grains of sodium bromide even better results appear to be attained.

The patient shows no aversion to this treatment, and in our experience it does not cause nausea or vomiting.

By Dr. Karl von Ruck,

Winyah Sanatorium, Asheville, N. C.

A questionnaire received from the editor of the THERAPEUTIC GAZETTE, Dr. H. A. Hare, appears to have the object to obtain the opinions of the physicians addressed upon some of the subjects connected with the above title.

My inclusion amongst them may be justified in that I have been a student of tuberculous disease for more than fifty years, beginning with the controversy between the French school, represented by Bayle, Laennec, Louis, and Villemin, and the German school, represented by Virchow and Niemeyer; the latter being then the clinical exponent of the former's pathological views and researches, and at the same time my teacher.

During this time my interest in the subject steadily increased, and since 1888 I limited my clinical and scientific studies to tuberculosis, especially to its chemical and biological problems, which have become increasingly important for the interpretation of physiological, pathological, and clinical observations.

Dr. Hare's questions have already been given.

In considering the first two questions, both can be answered together, after we have first decided what shall be considered "active" or "inactive" cases and whether or not we shall include pulmonary phthisis as well.

The question of remedies needs, however, no other answer than to say that if by "medicinal agents" are meant drugs, I know none of direct value, and therefore do not use them.

The terms active or inactive are purely symptomatic and do not always indicate the causes which stand in relation and which

are essential to be understood. They become apparent from a study of the evolution of tubercle and the various changes it can undergo from the earliest beginning, after the tubercle bacillus has found lodgment in tissues in which it can grow and multiply.

Dr. Hare, in the letter accompanying his questions, suggests, however, that they should be considered as a text, rather than for a simple answer of yes or no. I, therefore, conform with his suggestion by tracing the changes in the tuberculous processes in the light of specific, cellular, and humoral resistance, which may be present, or may develop and increase locally at the seat of the infection, and then in its immediate neighborhood, and finally becomes general. The cell complex which we call "tubercle" originates from connective tissue (I believe the connective tissue cells are chiefly if not exclusively concerned and intimately related to the specific resistance referred to), and the destiny of tubercle depends upon its presence and increase. This being the case we can explain the known facts that tubercle may disappear entirely, become obliterated by conversion of its cells into connective tissue, or the cells may undergo necrosis—*i. e.*, caseation. Caseous tubercle may thereafter become encapsulated or may soften; the softened and liquefied material may be absorbed, or may be discharged outwardly, leaving an open ulcer or a cavity. Apart from the cellular resistance there is, however, another factor which participates in the changes mentioned and which can modify them, namely, the degree of virulence of the tubercle bacillus which has gained access to the tissues.

The resistance of the tissue cells also differs according to the inherited racial resistance often spoken of as normal, and that which develops as a result of bacillary toxins, which come in contact with the cells and are liberated during the life of the tubercle bacilli and thereafter from their dead, disintegrating bodies. The former are metabolic products or exotoxins, and increase the cell resistance against them; the latter are body substances or endotoxins, which cause resistance against the tubercle bacillus itself. Both forms of resistance can increase when the products of the related toxins are liberated slowly, intermittently, and when their quantity is not excessive; the resistance may also be lessened or overcome entirely, if the conditions are reversed. The metabolic toxins cause the degeneration of the tubercle cells. The bacillary body toxins cause resistance to the life and virulence of the bacilli.

Racial resistance appears to be a cell function directed against the microörganism rather than against their metabolic toxins. It has no doubt also been acquired in the past; the degree differs according to the previous presence of tuberculosis in the race, and particularly in the ascendants of the individual member of the race. It may in time increase, or become diminished or lost by intermarriage. It is absent in primitive races, which have previously not been subject to tuberculous disease, in whom the evolution of tuberculosis is rapid or acute, but it may also be slower when the infecting bacteria have themselves lost more or less of their virulence. Such individuals may then also develop their own resistance by the toxins liberated from their own tuberculous lesions.

Racial resistance develops not only to the tubercle bacillus, but also to other infections, as for instance in syphilis. It is of the utmost etiological importance. It influences the early evolution and the subsequent course of the disease. Being strictly specific it is related only to the particular infection, in our consideration to "the bacillus of tuberculosis." Without it the individual may be said to be *predisposed*, the same as may be said of certain animals, as for instance the guinea-pig, and this is the only predisposition I recognize as applicable to the *acquirement of tuberculosis*, but not as applicable to the advent of "phthisis."

In the absence of racial or so-called natural resistance, there is no check to the

growth, multiplication, and virulence of the tubercle bacillus, nor to its rapid spread and eventual advent in the blood. The subject of the infection becomes overwhelmed by the increasing production and absorption of their metabolic toxins. The disease becomes disseminated, often running a fatal course as we see it in aboriginals and in some of the lower animals, or in acute miliary tuberculosis in man.

This acute febrile course represents an active or rapid progress of tubercle formation in which the fever is due to metabolic toxins. The latter cause the tubercle cells to degenerate and caseate, but ulcerations and excavations are rare. The fatal issue occurs too early and is due to acute toxemia.

The virulence of tubercle bacilli is, however, also liable to variation. If the prior host was a member of a different species of animal, the virulence may be lacking or only slight. If the prior host belongs to the same species it may still have lost in virulence through the antagonistic action of the cells and body fluids of the prior host, or may have lost in this respect by exposure to sunlight, by drying, and by the time intervening before it reaches its new host. Taking further into consideration the degree of the racial resistance of the new host, and new defensive substances which develop promptly at the site of the infection, it is not difficult to realize that the course of tuberculosis can and must differ in many ways; that the infection may never develop into clinically manifest disease; that its progress may be so slow that there are no symptoms; that it may heal, or it may follow a chronic or a more rapid, fatal course.

Inasmuch as in old civilized races tuberculosis has always been prevalent, their resistance is as a rule sufficiently developed to confine the formation of tubercle to the locality first infected, and thereafter permits it to extend only slowly to adjacent tissue; it is not frequent that enough metabolic products or exotoxins reach the circulation to cause fever; the toxins becoming anchored to the cells, and their resistance decreasing, they are destroyed or neutralized locally or in the periphery of the lesions.

If, therefore, the criterion for "active" or "non-active" tuberculosis is fever, we must not confound these terms with "progressive" or "non-progressive" or with so-called latent forms of tuberculosis, because the tissue changes need not be, and frequently are not, identical. The facts are that the most frequent course of chronic purely tuberculous disease in the lungs, lymph glands, and in other organs, excepting perhaps the nervous system, is not attended by fever nor by other symptoms, that call attention to it; and that if symptoms occur, they are due to a toxemia, the origin and cause of which may seem obscure. In tuberculosis, the most frequent symptoms of slighter degree of toxemia are disturbances in nutrition and malaise, of short or longer duration, the latter depending upon the absorption and the more or less complete neutralization or destruction of the bacillary toxins, by cells which have acquired this function.

Fever, if it occurs, is usually slight and transient. There is nothing characteristic by which the nature of its cause can be distinguished. Although as a rule bacterial toxins are responsible, there are also non-bacterial poisonous substances which when absorbed cause fever.

When we assume that tubercle bacillus toxins are the cause of fever, the assumption is based upon our previous knowledge that tuberculosis is present and upon exclusion of other infections. Whether or not we shall accept *exo* or *endo* toxins or the preponderance of either is a still more problematic question, in the decision of which we must take into consideration physical findings, the type and degree of the fever, and the stage of the disease. Being able to exclude other causes, and finding the tuberculous disease in the so-called closed state, we are justified to assume that exotoxins stand in relation to slighter degrees of fever, whereas in the state of softening and excavation endotoxins or

bacillary body substances are likely to be responsible.

Fever in tuberculosis depends therefore upon the absorption of tubercle bacillus toxins in excessive amounts, and when this occurs continuously or too frequently the protective substances upon which the specific resistance depends are anchored and bound to the toxins more or less continuously, thus leaving the organism with little or no defense.

During such periods fever continues as a clinical symptom until the source subsides and a balance is restored, or until a complete state of exhaustion is reached, when no further reaction is possible. If on the other hand the cell resistance in, and peripheral to, a tuberculous lesion became complete and maximal against all body constituents of tubercle bacilli, and the lesion is small, or if larger it has not reached a destructive stage, we have a spontaneous recovery of the local lesion.

Such complete recoveries, occurring spontaneously, are quite frequent and are represented by the fibrous, calcareous or so-called obsolete changes which are found in autopsies after death from other causes. Clinical manifestations need never have been present. The specific resistance has however not become general and complete in the sense that all other cells of the individual organism have acquired it. It may be local and confined to the cells of the lesion and its periphery, a fact which may be readily appreciated by observers, who are familiar with autopsy findings in tuberculous subjects, in which healed lesions like the ones referred to are often found coexisting with more recent tubercle, and with destructive processes in the same part or organ or in distant parts. In the light of biological research, when applied to tuberculosis, it becomes apparent:

First, that the defensive functions of the tissue cells are rarely sufficient to prevent the pathogenic action of the tubercle bacillus when it first finds lodgment; else no infection could occur.

Second, that the cell defense is often inadequate at the local lesion; else no extension could occur.

Third, that the defense does not become maximal and general; else localization in the distant parts or organs would not be possible.

Fourth, that it often comes too late; else phthisis and destructive changes would not follow in the tissues that have become the seat of tubercle.

All this finds ready explanation by consideration of the further biological fact that an increase of specific cellular resistance against the bacillus occurs only in response to its related body substances, that it represents a bactericidal or bacteriolytic function, which must be adequate not only for one but for all the body constituents of the tubercle bacillus, which differ in their molecular and atomic configuration.

In the foregoing I have endeavored to show that the presence or absence of fever cannot serve for a criterion of active or non-active, or for progressive or non-progressive, forms of tuberculous disease, in order to express our meaning with sufficient uniformity of the pathological processes and biological reactions with which we may be confronted in the individual case.

Similar or more complex anatomical changes occur, and biological reactions become more marked and complicated, with the advent of phthisis. The subjective and objective symptoms and signs also change and increase with its advent. Phthisis is initiated with the softening of caseous foci, which leads to ulceration and excavation, thus changing the so-called closed state into the open one. These foci may be multiple, when perforations into a bronchus may occur successively, or adjacent foci may not find a direct exit into a bronchus; drainage may thus be delayed or remain incomplete, until the intervening partitions are broken down. With complete drainage the fever subsides.

The further course depends now upon a great variety of circumstances and conditions, which may or may not obtain. Given a case in which the softening focus was

single and circumscribed, that the tuberculous abscess drained early into a bronchus, that the softening was not caused by or did not become complicated by infections with other pathogenic bacteria, that the caseous walls of the cavity or the surface of the ulcer soon became clean, such a focus would quickly cicatrize and heal. Assuming further that no other caseous foci liable to break down were present, or that if present they were firmly encapsulated, we would have a clinical recovery; and in case the specific cell resistance had been adequately increased by the absorption of bacillary endotoxins and became general, then the recovery would be permanent.

It remains for the reader to form his own mental picture of what would or could happen if all or any one of these favorable conditions were lacking, or were reversed. The complications that can then arise are numerous. Even in the process of softening of the caseous lesion, which is rarely an autolytic one, and is as a rule caused by other pathogenic microörganisms, dry or exudative pleurisy may occur before drainage has occurred, or if the focus has been small, the pleurisy may be all that attracts attention; if the focus is larger, pleurisy can still appear before it perforates into a bronchus, in which case bacillary sputum will appear later.

When a cavity or ulcer is once in communication with a bronchus other infections may cause further febrile complications, and the absorption of dead or living virulent tubercle bacilli into the blood during the stage of softening must also be thought of in order to account for all that can follow from the simple catarrhal bronchitis of the efferent bronchi over which the secretions must pass to broncho and caseous pneumonias, and spontaneous pneumothorax in the lungs. Catarrhal and tuberculous affections of the upper air-passages, endo- and pericarditis, generalized tuberculosis with localization in distant organs and upon serous and mucous membranes, are all complications that are liable to appear and be attended by marked fever.

Here it is important to realize that neither phthisis nor the complications referred to could have occurred if the cellular resistance against the tubercle bacillus had become adequate in the earlier phases, before the state of softening of caseous tubercle had been reached.

We all know that pulmonary phthisis may also have an entirely afebrile course; even in the period of initial softening fever may be absent, providing that the focus is relatively small or is already surrounded by a dense connective tissue or fibrous enclosure, which hinders and limits the absorption of the liquefied material.

Seeing that many cases of tuberculosis recover spontaneously, the old dictum "once tuberculous always tuberculous" is no longer justified. The truth of the newer and now better established dictum that everybody has, or has had, at least a little tuberculosis, and that but few persons escape infection in childhood, has become more and more evident. The well-known prevalence of tuberculous infections in children has also changed the older adverse prognostic views. In tuberculosis of childhood, and even in instances of phthisis of all but very young children, the prognosis has been found to be at least not worse than in the adult. It is not, however, frequent that tuberculous children reach the stage of phthisis before adolescence, because as a rule in infants and young children the tuberculous affections are chiefly glandular and the lungs' parenchyma remains free; when tubercles form in it later, a certain degree of general resistance has already been acquired by which the disease in other organs is retarded, or may heal out entirely.

For details of my own studies in tuberculosis of childhood, which confirm the foregoing statements, the reader is referred to a previous publication on "Immunization in Tuberculosis."[1] My analysis in 1512 cases of children shows that there were only 20 in which the biological tests with tuberculin, or with a vaccine prepared by me, were negative, mostly in infants under one year of age. In all other children the biological

[1]Studies in Immunization against Tuberculosis. Paul Hoeber, N. Y., 1916, Part II, p. 113.

tests were positive; enlarged lymph glands were found in nearly all instances when the reaction was positive, and physical signs in the lungs could be elicited in 33.5 per cent, being mostly older children.

Since the time when the foregoing observations were tabulated our observations have been continued and extended, and while I have not found the time for the critical study of them, the results in about 2000 additional children are practically the same.

Considering the fact that almost all the children under consideration were known to have been exposed to infection, the findings are about the same as have been recorded by other observers.

In the preceding discussion and expression of my own views, it matters not whether the reader rejects the relation of bacterial toxins to fever in infectious diseases; the fact remains that it cannot be explained otherwise, and it applies to tuberculosis, unless its infectious nature be denied. Whether or not my views upon the relation of cell resistance to the tubercle bacillus and its varying degrees of virulence, or the specific nature of either, be accepted, the fact remains that the resistance is as a rule insufficient.

That the course of the disease is extremely variable and frequently terminates fatally remains a fact whether we bring it in relation to the cell resistance or not, and finally we are obliged to admit that if there is indeed a variable degree of resistance, its manifestation comes too late in at least all cases where the disease becomes manifest clinically, and especially when it terminates fatally. The objecting reader is, however, not entitled to form opinion either for himself or for others on the all-important questions whether or not we can anticipate this lack of resistance to tuberculous infection, or increase it, after it has occurred, and thus prevent clinical disease with the consequences, or intervene effectively in that late period. To do this he must personally have demonstrated the contrary and must be conscious that his ability and his experience are ample enough to form conclusions. The methods by which the desired results may be accomplished, and have been accomplished by myself and others, will be considered later on in connection with questions Nos. 7, 8, and 9.

Summarizing now my reply to questions one and two, I submit that we have no reliable criterion for accepting an active or inactive, progressive or non-progressive, stage of tuberculosis, nor for its advanced stages in the lung, which we call pulmonary phthisis; that at the present time we know of no drug remedy which prevents, retards, or otherwise favorably influences the evolution of tubercle, or the course of tuberculosis, and none that can influence adversely the tubercle bacillus or its virulence, or destroy its toxic products.

Proceeding now to answer question No. 3, I again deny the value of drug remedies, including creosote and other germicidal preparations, as curative agents by directly or indirectly favorably influencing tuberculosis, or by action upon the related bacillus and its toxins.

Certain drug remedies have however been observed by others and by myself to directly affect purely tuberculous lesions, as, for instance, cantharidin, introduced by Liebreich during the early tuberculin period, and cinnamonic acid, introduced later by Landerer in the form of hetol; also iodine and its salts. These preparations, especially cantharidin and hetol, appear to have a selective influence upon tubercle, and cause focal reactions, evidenced by hyperemia, similar to those we are familiar with under the administration of Koch's tuberculin, or of other products of the bacillus of tuberculosis. During my own observations I was obliged to abandon cantharidin on account of local aseptic abscesses at the injection site, and also because of its irritating effects upon the kidneys, without noting any other influence upon tuberculous disease.

That iodides appear to have a favorable influence upon lymph gland tuberculosis, especially in children, is still generally recognized; in pulmonary phthisis their administration increases secretions and ab-

sorption. It has also been said that they contribute to the process of softening of caseous tissue. I myself do not believe that iodine or its salts can initiate this process, but incline to the view that by its stimulating effects upon absorption, especially in lymph structure, it promotes autoimmunization with the absorbed toxins.

In further referring to creosote and other germicidal drug remedies like formalin, they appear to have been found valuable in phthisis when complicated by other infections, and while not influencing the destiny of tubercle, even in very large doses, and have no bactericidal influence upon the more resistant tubercle bacillus, they appear to influence favorably the toxemia and pathogenic action of the less resisting bacteria in the so-called mixed infections of pulmonary phthisis, and I believe their acceptance, especially of creosote, in phthisio-therapeutics is thus fully explained.

In this connection I desire to refer to an interesting experience with copper, made by me in 1914, to which I had occasion to refer on page 309 of my Studies in Immunization. Regretting that I have been unable to find time to bring my investigations of copper upon the virulence of tubercle to a positive conclusion, I may state that when highly virulent tubercle bacilli were transplanted upon media which contained copper, while not interfering with their growth, they lost their virulence completely. The copper was found free in the culture media, but in the bodies of tubercle bacilli it appeared in an organic combination, requiring destructive analysis for its demonstration. Such tubercle bacilli showed slight morphological changes. They also lost their antigenic properties, as did their chemically isolated fractions in solution. After numerous generations in media free from copper their virulence was not restored, they still gave up their carbol-fuchsin stain much more readily to mineral acids, discoloring with 5-per-cent solution of sulphuric acid, while the normal organism retained its stain with a 25-per-cent solution of the acid.

The studies of Grafin Linden, which originated in Winkler's laboratory in Bonn, Germany, with copper as a therapeutic agent in tuberculosis, are probably known to most students of chemotherapy; and to such my own limited observations may be of interest, Grafin Linden having apparently not made experiments corresponding with my accidental observations.

Question No. 4, referring to absolute rest if there is any febrile movement, can also receive no general answer of yes or no. All depends upon the underlying cause. I have heretofore referred to the absorption of bacterial products and their relation to fever. Absolute rest in instances in which the absorption is excessive or continuous is certainly indicated, but I should also mention that in non-febrile cases sufficient exercise has been resorted to by other observers, in order to produce fever with the object of autoimmunization by the absorbed toxins, and good results appear to have been observed.

It must further be remembered that febrile movements need have no relation to the absorption of products of tubercle bacilli, or to other bacterial toxins; they may stand in relation to the absorption of non-toxic inflammatory products and exudates, or they may be caused by non-bacterial autointoxication, by constipation, chronic colitis, and digestive derangements, or other undetermined causes in which absolute rest may avail nothing or even aggravate the condition. The proper course to be followed is thus not always the same, and bearing in mind that if we choose absolute rest instead of a certain amount of exercise, we are accepting the lesser of two evils, since exercise is essential to normal life functions.

We therefore individualize, according to what we find to be the probable cause of the fever. When due to absorption of bacterial toxins, which cause but slight elevation of temperature and only for a few hours of the day, absolute rest is not necessary or beneficial. The exercise should, of course, be limited, the patient being, however, permitted to be up and for the most part at rest upon a reclining chair out-of-doors. In doubtful cases, or when the temperature

exceeds 100° F., and especially when above normal most of the time, a trial of absolute rest in bed should be made and the results compared, which would then indicate the further course to be followed.

In instances of continuous or intermittent types of fever, complete rest in bed is not only indicated but is sought by the patient himself. In the meanwhile, and in any case, we seek to find and remove its cause by appropriate therapeutic measures, to which I shall recur later on.

My answer to questions 5 and 6 must likewise be conditional. I certainly regard the resort to artificial pneumothorax as an extreme measure, if undertaken solely for the control of hemoptysis. To justify it, the hemoptysis must be so copious or continuous that we fear a fatal outcome, or our other means for its control must have failed, and the continued loss of blood even in lesser quantity must likewise threaten the life of the patient. Surely such instances are exceptional, and in extreme instances the hemorrhage is often fatal before we can reach our patient or compress the bleeding lung. Such severe hemorrhages occur only in cases of phthisis, and are most frequently due to rupture of aneurismal sacs in large cavities. Successful compression to such a degree as to include the bleeding vessel may fail on account of the surrounding dense fibrous tissue and of the presence of pleural adhesions, which latter may prevent the introduction of gas entirely, or may allow of but slight compression of a limited part of the lung, where we do not need it. Over older cavities the pleural surfaces are always adherent; otherwise we would observe spontaneous pneumothorax much oftener than we do, and these adhesions when forcibly stretched by the introduction of large quantities of gas may rupture the adherent lung tissue, which would defeat our object and perhaps add a new and more serious complication. Without such accidents and hindrances compression proves effective if in the compressed part the larger branches of the pulmonary artery are included and the circulating blood is thus sufficiently diminished, although the cavity itself is not compressed.

In the great majority of cases of hemoptysis the bleeding stops spontaneously. When we intervene therapeutically because of its persistence or of its recurrence we should first seek to know whether its origin is venous or arterial. If venous and therefore due to passive congestion, the position of the patient may influence it. A flat recumbent position does not tend to relief, whereas a sitting position and freer expansion in respiration act favorably. Indeed I have known of cases in which the removal of all restriction to the patient's liberties and still others in which respiratory exercise proved effective when other measures had failed.

In venous types stimulants may be required when the pulse is small and frequent and the heart action is feeble; such are the cases in which digitalis has been found valuable or in which ligation of the extremities, cupping and venesection have formerly earned their reputation.

If the origin of the hemorrhage is arterial, fear and excitement may increase the heart action, and excitement can also materially increase the blood-pressure. If our personal assurances do not bring tranquillity to the excited patient, a hypodermic dose of codeine or morphine is of benefit, and if the blood-pressure thereafter remains high, which is not usual in tuberculosis, it can be moderated by administering nitroglycerin or other nitrites, or veratrum viride. Absolute rest in the fully recumbent position should be enforced; an ice-bag should be applied over the cavity; stimulants and hot drinks excluded; and in any case, whether the hemorrhage is of venous or arterial origin, the bowels should be kept free and open. Unavailing cough may require additional doses of opiates, but the expectoration of retained blood and secretions should be rather encouraged than interfered with, because their gravitation or aspiration may lead to bronchopneumonia.

The internal administration of mineral and vegetable astringents, or their local

application by inhalation as vapors and sprays, is now largely abandoned. Their use requires no further comment than to say that the success following their employment is equally problematical and unproved, as was the case with the one-time popular use of ergot or ergotin in the course of administration of which the pulmonary hemorrhage happened to stop.

In later years other remedies have been presented with claims that they increase the coagulability of the blood and thus favor the formation of a firmer clot in and around the bleeding vessel, which occurs spontaneously after considerable loss of blood. Whether or not the administration of a foreign blood serum has a similar effect, and of the value of either method, I am not prepared to give a positive opinion.

Severe and apparently uncontrollable instances of hemoptysis were few, and cases of hemoptysis in any degree to justify the term of "hemorrhage" have occurred in my clinical material of pulmonary phthisis in less than 3 per cent. Among them were about twelve instances which proved fatal at once, with no time available to adopt any method of treatment. In cases in which we resorted to compression the result was prompt and immediate when a sufficient amount of gas could be introduced and thereafter maintained. Partial compression moderated the bleeding in others, and in some instances where we attempted it adhesions prevented the introduction of gas; the hemorrhage nevertheless subsided under other modes of management. In all cases the destructive changes in the lung were progressive, and compression was indicated and had previously been recommended apart from the occurrence of the hemorrhage.

(To be concluded.)

Goat's Milk.

In the *Archives of Pediatrics* for September, 1921, CALVIN states that practically all publications dealing with milk goats attribute considerable importance to the use of the milk for infants and invalids.

A considerable number of cases in which goat's milk has proved especially valuable for infants and invalids are on record. In many of these cases other foods had been tried and did not seem to agree with the patients. The following is taken from Bulletin 429 of the New York Agricultural Experimental Station under the heading "Summary." Extensive study of the use of goat's milk in infant feeding by Sherman and Lohnes, of Buffalo, showed that the curds of goat's milk, when returned from the stomach, were smaller and more flocculent than those of cow's milk. From the determination of the combined hydrochloric acid in the returned food the authors conclude that the cow's milk had a greater stimulating effect on the stomach than goat's milk. The absorption of the food and gain in weight in comparing the two milks were indefinite for several reasons. The babies tolerated equally well similar amounts of goat's milk with cow's milk when used with the same diluents. The younger the child the more the evidence pointed toward a greater gain on goat's milk.

Goat's milk was supplied to 18 cases of children who were not thriving on any other food that had been tried. In 17 cases a satisfactory state of nutrition was established through the use of goat's milk, the beneficial results in some instances being very marked. With certain of these children their situation was regarded as serious, and their restoration to a satisfactory nutritional condition was good evidence that goat's milk is often a very desirable resort for infant feeding. Griffith states that in infant feeding goat's milk may sometimes be advantageously employed when that of the cow is not obtainable.

In a project carried on coöperatively by the Sea View Hospital, New York, and the Bureau of Animal Industry, the value of goat's milk for tuberculous patients was investigated. The cases treated were all pulmonary tuberculosis varying from quiescent, with slight infiltration, to active, far-advanced cases with extensive infiltration and cavitation. Adolescents were preferably chosen, irrespective of sex, and in

order to have as many as possible under treatment at the same time some were accepted as low as six years of age. The results showed that the goat's milk cases and the controls progressed about the same and both gained about the same weight. These results are therefore negative.

Goat's milk can be utilized for the same purposes as cow's milk—*i.e.*, for drinking, cooking, in cakes, tea and coffee, to which it is said to give a rich flavor, and large quantities of goat's milk cheese are manufactured in Europe. It is not very satisfactory for making butter.

Cautley states that the main advantage of goat's milk is that with a small plot of grass one can keep a goat, feed it carefully, and obtain fresh, pure milk. Pfaundler and Schlossmann's text states that because many people can afford to keep a goat, if goat's milk is aseptically obtained it is the most suitable substitute for breast milk, since it has not been exposed to the possibility of changes, has not lost its natural properties, and can be given raw. Thus the deterioration entailed in dealing with the milk and transporting it is diminished. In fact, in many localities where it is easy to keep a goat, fresh cow's milk is difficult to obtain. A goat can be kept where it is impossible to keep a cow, and it will consume considerable feed that otherwise would be wasted. In England and in many other parts of Europe, people who leave the cities during the summer months either for their country homes or for travel, often take a milk goat with them so that the infant may have a good supply of fresh milk of uniform quality. No other animal is so well adapted for such a purpose, and there is probably no other country where goats are so much needed for such a purpose as in the United States.

Babies can take the milk directly from the udder. It is customary in many parts of France and Switzerland to carefully wash the udder and teats and permit the infant to suckle directly, which certainly insures fresh, clean milk. The goat has proven a splendid foster mother for infants, calves, lambs, colts, and pigs.

The goat is a very clean animal, and the dry condition of the normal stool makes it easily possible to keep the udder clean. Because of the solid feces there is much less danger of contamination of the milk. Goats acquire enteritis much less frequently than cows. The cow easily develops a diarrhea, with accompanying danger of infecting the milk with virulent bacteria.

Another advantage of goat's milk is that it cannot be skimmed as the cream does not form a distinct layer. Consequently, dishonest dealing along this line is obviated.

Goats are practically immune to tuberculosis. Only 0.4 to 0.6 per cent of the goats in Prussia gave a positive reaction for tuberculosis. The question of the transmission of a passive immunity to tuberculosis by the transfer of natural antibodies from goat's milk to very young infants, or from the use of this milk over a much longer period, is a subject of investigation, at present incomplete.

It might appear from some very limited data that goat's milk is considerably higher in antiscorbutic properties than cow's milk. Moore states that six guinea-pigs weighing from 110 to 145 gm. each were fed on fresh goat's milk, one set for 80 days, a second for 44 days. The animals developed normally with no clinical symptoms of scurvy, although similar experiments with cow's milk resulted in scurvy.

From the foregoing facts it is evident that goat's milk deserves more consideration than it is at present receiving in this country. Under certain circumstances it appears to be a valuable artificial food for infants. More experimental work to determine its exact status in the feeding of normal and sick infants should be carried out so as to place it on a sound scientific basis. The milk-goat industry is only in its infancy in America. The wide-spread use of goat's milk will sooner or later be a fact in this country because of the milk's many practical advantages in special instances.

Editorial

THE APPLICATION OF THE WASSERMANN REPORT.

Many years ago, before the introduction of various laboratory methods, when practitioners were dependent solely upon their powers of observation with the eye, ear, and hand, there can be no question that many of them attained a degree of skill which in these modern days is rarely found. To-day laboratory technique is taught so strongly in medical schools and in post-graduate courses that the average man is inclined to resort largely to these methods in the presence of illness, and even if he studies his case accurately in other respects is prone to give up his own results as being in error if the laboratory report seems to be in conflict with his own observations.

There can be no question, of course, that modern laboratory methods have greatly increased the ability of the physician to reach a correct diagnosis, and that they are at times the only means by which this result can be attained, but all too frequently the results of the laboratory tests receive too much confidence and so actually mislead the practitioner. It ought always to be borne in mind that the returns from laboratory tests are to be fitted in with the results of bedside examination, forming only pieces out of which the diagnostic arch may be erected. All too frequently, for example, a negative diagnosis as to tuberculosis is reached because tubercle bacilli do not happen to be found in the sputum. Again we have known of cases in which tuberculosis of the kidney was believed to exist because the urine contained the smegma bacillus.

Perhaps the greatest error at the present time lies in the importance which is attached to the so-called Wassermann test, a test which is of the greatest possible value and one which marks a truly great advance in diagnostic methods, and, therefore, in some cases is given undue importance.

Attention is called to this important subject in a recent article by Dock (*Journal of the Missouri State Medical Association*), in a communication which bears the title heading this editorial note. While recognizing the value of the Wassermann test he well points out that it is not specific; that is, it is not an exact test in the sense that many chemical tests for inorganic substances are exact. Neither does it compare in diagnostic accuracy with the demonstration of the tubercle bacillus, the bacillus of Eberth, the malarial parasite, or many of the other microörganisms which infect the human body. He goes even one step further and asserts that it is uncertain in the sense that in the hands of the most expert it may give a positive result where there is no syphilis, or a negative result when the signs and a history of infection cannot be questioned.

Furthermore, it is probable that the conditions which influence the Wassermann test vary somewhat from time to time in the individual who is tested entirely independent of treatment, and again this test is subject to the same exceptions which are common to all laboratory tests, and certain conditions of disease and the administration of certain drugs may lead to a positive diagnosis when a negative one should be reached.

Dock also points out that another serious feature of the present attitude toward the Wassermann report is that it tends to diminish the accuracy with which the physician regards his patient; that is to say, instead of relying largely upon the general symptomatology of the case, he pins his prognosis and further therapeutic measures solely upon the report which he receives from the laboratory. And again he points out that evidence is beginning to accumulate to the effect that an actual increase in central nervous lesions under the present methods of treatment seems to be in evidence.

Another point, which Dock does not mention but which nevertheless is important, is the tendency of a physician to ascribe all symptoms which a patient may

present to the presence of an old specific infection. Bearing in mind the fact that syphilis is competent to attack every tissue of the body, the tendency to consider that whenever any tissue is out of order syphilitic infection must be the cause is perhaps a natural one, but on the other hand it is not to be forgotten that many thousands of persons who would give a positive Wassermann test and who have a definite history of a syphilitic infection nevertheless may be for long periods of time in perfect health, are susceptible to the same maladies as individuals not so infected, and when so stricken do not need specific treatment any more than a non-specific case needs it. Under these circumstances the report of a positive Wassermann test is of interest as to the future history of the patient rather than as to his immediate treatment.

Last of all, the responsibility of a physician who makes a diagnosis of syphilitic infection because of a positive Wassermann report is an exceedingly grave one. The very fact that errors sometimes occur even in the best laboratories indicates that a patient may be condemned to years of mental anxiety by being given such information. It is only when there is a fairly clear history of exposure and the Wassermann test is 4+, when all other factors that could produce a 4+ have been eliminated and when there are clinical symptoms which the physician is able to perceive, that the physician should put himself on record in a matter of this kind.

Dock cites the case of one patient who, having been given a 4+ Wassermann report in one laboratory and having been told that it meant that he had syphilis, went from city to city to find additional laboratories and also to find that their reports were all negative, although the first one had been positive; and, on the other hand, the case of a surgeon who suffered from a wound during operation, who presented a local lesion believed to be a hard sore and all the symptoms of a severe initial and secondary syphilis, in whom the Wassermann report was negative repeatedly, yet the diagnosis of his physicians was confirmed not only by the symptoms of the patient, but by the fact that active specific treatment proved to be not only therapeutically advantageous, but made in addition a therapeutic test that was beyond all doubt.

THE PROPER INTRAVENOUS DOSE OF STROPHANTHINE AND STROPHANTHONE.

We think it may be stated without question that strophanthus does not occupy the high position as a cardiac tonic and remedy it possessed twenty years ago. One of the reasons for this undoubtedly lies in the fact that many physicians have employed the tincture in too small doses, or, when they have been bolder and used it in large doses over any considerable time, the patient has not infrequently suffered from a troublesome diarrhea.

Again, it has been shown by numerous investigators that tincture of strophanthus is absorbed very slowly by the alimentary canal, and it is almost impossible to determine how much actually enters the system, in the sense that it is capable of affecting the heart, because such incomplete absorption takes place. For this reason a large number of clinicians have resorted to the intravenous injection of the active principle of strophanthus, strophanthine as made in Germany or strophanthone as produced in this country, and medical literature contains not a few reports in which such intravenous injections administered to patients suffering from ruptured compensation, and seemingly at the point of death, have seemed to be life-saving in their effects. On the other hand, it has been shown that in some patients disaster has followed such an injection either because it has been given too rapidly, in too large a dose, or, equally important, because full doses of digitalis have preceded it. It seems to have been pretty well proved that it is unsafe to give such an intravenous injection if full doses of digitalis have been administered within the preceding few days.

The question now arises as to whether better results cannot be obtained by modifying the method of intravenous injection. It has been customary heretofore to give such an injection not more frequently than every twenty-four or forty-eight hours because it has been found that the effects of such medication usually persist for this period of time. On the other hand, it must be evident that the injection of such a dose sends into the circulation within a very brief space of time a quantity which if it is strong enough to maintain its effects for forty-eight hours may also be strong enough to immediately produce disagreeable symptoms.

For this reason we have been interested in a contribution made by Danielopolu to *La Presse Médicale* entitled "The Treatment with Strophanthine by a Method of Fractional Doses." He quotes largely from the literature dealing with the therapeutic properties of strophanthus and reminds us that it has an action closely allied to that of digitalis, that when given intravenously it acts much more rapidly, although not so persistently as does digitalis, and, furthermore, that if small doses are given by the intravenous method instead of one large dose, all danger is practically avoided, yet in the course of one or two days the full physiological action of the drug is rapidly established without the dangers to which we have already referred. He considers that the ordinary maximum dose has usually been from a 125th to a 60th of a grain, and his suggestion is, therefore, that the same amounts should be given in broken doses rather than all at once.

SCARLET FEVER PROPHYLAXIS AND SCIENTIFIC ENTHUSIASM.

Scarlet fever still remains, to a certain extent at least, an unknown quantity so far as the organism responsible for its development is concerned. A vast amount of work has been done in order to isolate this organism. No sooner has one investigator thought that he had obtained it than the next has seemed to prove that he was in error. Some have believed that it belongs to the filterable viruses, and others that it is simply a modified or peculiar form of the streptococcus.

We think that our readers will be interested in a report called "A preliminary communication" by Takahashi from the Kitasato Institute for Infectious Diseases in Tokio, not only because it may point the way to the prevention of outbreaks of scarlet fever, but also because it is a remarkable illustration of scientific enthusiasm, in that this investigator carried out his experiments upon five of his own children. Starting out upon the basis that Kusama had carried out experiments against typhus by prophylactic inoculation with infected monkey's blood, and furthermore that Kusama had found that by diluting the blood obtained from human typhus patients injections could be given which caused no reaction but conferred a degree of active immunity, bearing in mind also that the quantity of typhus virus, sufficient to induce this immunity, was found to be less than 1:100,000 of the quantity required to cause the disease, Takahashi determined to apply Kusama's method to measles and other diseases.

As he expresses it, unfortunately for his purpose, all five of his children had already had measles and he was unable to procure others, but just at this time a typical scarlet fever patient appeared, and his work began. Takahashi refers to the studies of a number of investigators as to the source from which one is most likely to obtain the truly infectious material—that is, material which is really capable of inducing scarlet fever in another person. He believes that there is no doubt that the blood and secretions of the throat and tonsils contain the virus. Taking blood from the median vein of a girl of eleven years suffering from scarlet fever on the sixth day of the illness, by means of a sterile syringe containing 2 per cent of sodium citrate in a salt solution, he transferred it to four test-tubes containing a fixed amount of one-per-cent sodium citrate so that 1 cc of the diluted solution contained

0.0001 cc of the patient's blood, or a dilution of 10,000 times, and this was used to inoculate his children, each one of whom received 1 cc, with the exception of the youngest, a boy of about three years, who received ½ cc. During the next three weeks careful examinations as to temperature, urine, throat, and general symptoms were made. There was no reaction, local or general. He therefore concluded that the injections already made were powerless to cause the disease in a human subject.

Taking another patient, a boy of seventeen years, with undoubted scarlet fever, and taking the blood as in the previous experiment so that 1 cc of the final solution contained 0.1 cc of blood, he gave this to each of his children, except the boy of three years, who received 0.6 cc. During the following three weeks the same careful examinations were made, and no local reactions and no general symptoms developed.

For this reason Takahashi believes that he is correct in feeling that the injection of 0.0001 cc of the blood of a scarlet-fever patient into children produces no reaction, but confers the degree of active immunity sufficient to prevent a recurrence of the disease on the introduction of the virus contained in 0.15 cc of blood. In order to confirm this belief he exposed his children once more in a manner which commands our admiration but scarcely our justification.

Taking a patient of twenty-two years with undoubted scarlet fever, he took the throat secretion, after carefully gargling, and the blood from the median vein as in the previous cases. To be sure that this material contained the virus the secretion was injected subcutaneously into a monkey and the blood into another monkey. The first monkey developed a high fever on the fifteenth day lasting for five days, and the second monkey a high fever on the seventh day with an eruption over the face and around the eyes. These symptoms agreeing with those of experimental scarlet fever in man, Takahashi then proceeded to carefully smear the secretion of the scarlet fever patient over the mucous membrane of the tonsils and throat of two of his children. Examinations during three weeks showed no manifestations of local or general infection. Takahashi recognizes that he cannot claim that his experiments are flawless. One flaw, of course, rests in the fact that the smears used were many days old when used on the children and may have lost their virulence. Whatever may be the fault of his technique, his work is certainly most interesting and he promises further investigations, the chief object of which will be to determine the duration of immunity which he has induced and the promptness of its appearance after inoculation.

OXYGEN IN THERAPEUTICS.

Although oxygen gas has been before the profession as a therapeutic agent for many years there has been much difference in opinion as to its real value. Some physicians have used it freely in every condition that was represented by air hunger. Others have given it in such small quantities that it manifestly could be of little value except for the psychic effect upon the patient and his relatives, and still others have wisely recognized that in some conditions of dyspnea its employment cannot be expected to do good, whereas in others its use in adequate quantities may be most advantageous. In the air hunger of advanced diabetes it cannot be expected to do good because in this condition there is no difficulty on the part of the blood in obtaining oxygen from atmospheric air, the dyspnea depending upon the fact that the carbonates of the blood having been decreased it is not possible for the patient to eliminate his carbon dioxide, and it will be recalled that in this type of dyspnea, cyanosis is replaced by undue redness of the mucous membrane of the lips. So, too, in the dyspnea of advanced anemia there is no difficulty in obtaining oxygen in the sense that the atmospheric air does not contain a sufficient quantity, but the diminished number of red blood cells makes it impossible for a sufficient amount of this gas to be carried to the tissues, and, there-

fore, except for such small quantities of oxygen as may be absorbed by the blood plasma, oxygen artificially supplied can do little good.

The same proposition, to some extent, holds true in the dyspnea of a failing heart, although in such instances the possibility of oxygen doing great good is materially increased.

Again, if the dyspnea is due to a toxemia, oxygen may or may not be of advantage. On the other hand, in those cases in which there is interference with proper circulation through the lung, such as consolidation or any other cause which prevents the blood from being able to obtain oxygen through the respired air, it is manifest that increasing the quantity of oxygen gas in the respired air may be most advantageous, and in such cases there is no doubt that it should be freely administered.

A practical difficulty in its free administration lies in the fact that a patient who is in distress will usually not tolerate the application of a mask by which a very large quantity of oxygen gas can be given, because instinctively he desires atmospheric air and is fearful of being deprived of it. Some patients also find it difficult to retain an inhaler which is placed between the lips, at least they believe themselves unable to close the lips about the inhaler because they wish to have not only the nostrils but the mouth open in order to maintain a free access of air. Of course where the patient is delirious these difficulties are materially increased.

The point that we wish to emphasize, however, is that if oxygen is used it must be used freely, and not only used freely in the sense that it is allowed to escape freely from the tubing attached to the tank, but that the patient must actually get it in large quantity, otherwise benefit from its employment cannot be expected.

The last few years have been very prolific of careful scientific studies concerning the value of oxygen, and as a result we have reached much better foundations for its rational employment in therapeutics. In a recent issue of the *Archives of Internal Medicine* there are no less than three papers dealing with its employment upon a scientific basis, and we think that our readers will be interested in the conclusions which have been arrived at. In one paper, Barach and Woodwell report their study of eleven patients with lobar pneumonia and four with bronchopneumonia. All of these at some time during the course of the disease manifested arterial anoxemia. Ten of the lobar patients were treated by the inhalation of oxygen, and in eight the blood-gas determinations were done before and after oxygen therapy. By the use of the oxygen the arterial oxygen saturation was increased in all except four, and in four it was raised to the normal level. In two of the patients with bronchopneumonia who had no arterial anoxemia, but who were nevertheless treated with oxygen, no marked change in oxygen saturation developed. So far as the clinical manifestations were concerned, these were marked by clearing of the cyanosis and slowing of the pulse. The respiratory rate was inconstantly lowered. The mental condition of the patient was frequently improved, but, contradictory as it seems, the statement is made that the dyspnea was not usually relieved.

A very important point which these investigators make is one to which we have already referred, namely, that the oxygen inhalations should be continued for half-hour periods and in severe cases for one- or two-hour periods. Naturally these administrations are often in effect only temporary, but nevertheless the oxygen gas frequently repeated aids the patient in his progress toward recovery, and without doubt diminution of respiratory distress and decrease of activity on the part of the respiratory muscles and the heart do much toward maintaining vital resistance and strength. For these reasons these investigators conclude that oxygen therapy has a rational rôle in the treatment of pneumonia.

In another paper by the same authors, in which they review quite extensively the literature on oxygen inhalations and the changes in the content of the blood in various conditions, they show that in a

normal man the inhalations of oxygen for half an hour cause an increase in the oxygen saturation of the arterial and venous blood. They also found in seven cases of ruptured compensation suffering from anoxemia that oxygen inhalations regularly increase the arterial saturation. In those where there was passive congestion and edema at the base of the lungs the arterial saturation was raised to the normal by the inhalations of oxygen for half an hour, and in other cases which were characterized by wide-spread pulmonary edema the decrease of arterial anoxemia was accomplished in from forty-five minutes to two hours, there being also an increase in venous saturation.

In emphysema and acute and chronic bronchitis characterized by anoxemia, they also found that inhalations produced advantageous effects not only as manifested by gas analysis, but also by slowing of the pulse and relief of the cyanosis.

A WORD MORE ABOUT QUINIDINE AND AURICULAR FIBRILLATION.

In the December issue of the THERAPEUTIC GAZETTE, in these columns, we called attention to the extraordinary power of quinidine sulphate to overcome auricular fibrillation in about 50 per cent of cases, recalling to mind that Sir James Mackenzie and a number of other cardiologists had nevertheless issued a warning against its careless employment because we do not know enough concerning its full action. It would now seem to be pretty definitely shown that quinidine sulphate, while possessing the power to which we have referred, is a remedy which should be used most cautiously, because it diminishes the irritability and contractility of the cardiac muscle and because, even though it has been used in a large number of cases, the dose which is efficient does not as yet seem to have been fixed upon.

Possibly the most important point to be remembered concerning it is that the mere existence of auricular fibrillation does not necessitate the administration of either digitalis or quinidine. It is only when the showers from the auricle tend to produce ventricular exhaustion or when the ventricle is weak because of inherent disease that digitalis is indicated, and this condition, so far as the condition of the ventricle is concerned, would seem to contraindicate the use of quinidine, or, to put it differently, as long as cardiac compensation is maintained, no treatment is needed. When cardiac compensation fails, it is a grave question as to whether the quinidine, while it may diminish fibrillation, may not at the same time, by depressing the heart muscle, do more harm than good. This matter may again be expressed in still a different manner, namely, that it is interesting from the standpoint of the pharmacologist that quinidine should have this power over a fibrillating auricular wall, and equally important to bear in mind that quinidine at present promises to be rather more useful in the pharmacological laboratory than at the bedside.

Whatever may be the ultimate conclusion concerning quinidine, it seems to be the universal opinion of those who have used it most that it should never be employed unless the patient is so situated that frequent studies concerning its influence can be made by means of the electrocardiograph.

Two recent communications by Wolferth before the Section of Medicine at the College of Physicians of Philadelphia serve to illustrate these facts, and they are again supported by the publication in the *Archives of Internal Medicine* for January of a paper by Eyster and Fahr, who insist that there is a definite danger in its use and urge the necessity of the utmost care in its administration, particularly in the more severe forms of chronic cardiac disease.

Again they point out what we have already referred to, that it should be used only after compensation is as thoroughly established as possible, which, being translated, means that in the very type of cases

suffering from auricular fibrillation in which circulatory support or correction is most needed, quinidine is a dangerous remedy to employ.

ACUTE SURGICAL ABDOMEN IN CHILDREN.

Colicky bellyache, acute indigestion characterized by severe, at times agonizing abdominal pain, probably due to spasm, as a rule excited by food too great in quantity and unwisely chosen, is so common in children and so habitually disappears either with or without treatment that both the layman and doctor are at times caught napping and fail to recognize that whilst this type of pain is, as a rule, in children of minor import, when it persists it usually indicates an intra-abdominal condition which can be relieved only by surgery. The pain of the true lesion may be equally intense, the difference being only in duration; the pain lasting minutes and disappearing not to return is almost certainly due to spasm. Pain lasting hours and disappearing and returning with equal or renewed intensity is almost certainly not due to spasm. In this relation Lanman (*Boston Medical and Surgical Journal,* Oct. 27, 1921) contributes a study of the last five years of the surgical service of the Children's Hospital.

Under the general heading of the surgical abdomen of course would be included cases of hernia. He notes there have been 1064 operations for hernia out of 4748 admissions to the hospital. Seven per cent of these hernias were umbilical, the rest inguinal. He notes that strangulation and incarceration of inguinal hernia is very rare. Out of 500 cases in the last two years, only three were strangulated; and of these three, two were reduced on the operating table when the child was under ether. The mass in the groin that stays the same size, is translucent, and does not reduce when the child is lying down and quiet, is practically always hydrocele.

Of the 1044 operations there has been only one death in cases of inguinal hernia, and two in umbilical. The author states that the age at the time of operation matters little, though it is the practice at the Children's Hospital to hold the hernia with a yarn truss, at least until the baby is weaned, or until it has been through its first summer. If it cannot be held, or home conditions are bad, operation is indicated. The age of choice for operation on undescended testicle is at least four to six years.

Umbilical hernia can in the vast majority of cases be cured by strapping. The chief difficulty encountered is the failure on the part of the parents to realize that strapping must be continuous. Great care must be taken. Recurrence in inguinal hernia is practically *nil.* The author has found only three cases. All were in first operations at a very early age, and the children developed some bronchitis following operation.

The author takes up the subject of surgery of the new-born with umbilical sepsis, which is seen in the hospital only in very desperate cases. It is more common in general practice. The cases seen are of three types:

The most favorable is that which presents a phlegmon of the abdominal wall which, by poulticing and by incision, if the abscess points, may lead to recovery. The prognosis is grave because the infants that develop this infection are of low vitality and resistance.

Then there is the type that has thrombosis of the hypogastric vessels and which will show septic emboli in the extremities, scrotum, liver, or spleen. The mortality here is 100 per cent.

The last type is the one that develops a peritonitis probably by direct extension. Of four such cases operated on and drained, none recovered.

Malformations of the gastrointestinal tract are generally either an atresia in greater or less degree of some part of the bowel; a complete absence of some part; or, more commonly, imperforate anus. The diagnosis is not long in doubt. No passage of meconium or feces by rectum, progressive distention and vomiting, going on to collapse.

Except for those cases that have merely an unbroken anal membrane, that can be broken by finger or hemostat, or those cases in which the obstruction is so low that the normal gut may be brought down and sutured to the skin at the anus, the prognosis is very bad. Of twelve such cases operated, none have lived. The operation for anastomosis is generally severe enough to kill the patient, and relief by enterostomy is seldom ultimately successful. In infants and children it is practically impossible to keep a permanent enterostomy or colostomy, because the constant crying will cause a prolapse that is extremely difficult to deal with.

Of 27 cases of imperforate anus treated without colostomy, 22 have recovered; a mortality of 18 per cent. It is very important in the after-care of these cases that they report for dilatation for a period of several months.

Pyloric stenosis is not an uncommon condition. The hospital figures give a series of 66 operations for this condition, with six deaths; a mortality of 9.9 per cent. It is, however, becoming recognized sooner, and with the development of the technique of the Ramstedt operation the condition has lost much of its gravity of prognosis. During the last year there were 22 operations for pyloric stenosis with no deaths.

The history and picture of pyloric stenosis is striking. The infant who has been doing well begins to vomit; first occasionally, then regularly with each feeding. The vomiting is forcible and projectile. There is also constipation and rapid and progressive wasting.

In making a diagnosis there are several points to consider. The time of onset is rarely before the first week; usually in the first month or six weeks, rarely later. The vomiting is constant; it comes directly after, or even during, feeding, and is more forcible than in any other condition. The story that the baby vomits over the foot of the crib, or three to five feet from the mother's lap, is common. Generally all the food is vomited; small amounts of regurgitation are not common. The vomitus is the food just taken, though in some cases the baby will keep two or three feedings and then vomit the whole amount. There is progressive and alarming wasting; generally constipation, but no fever.

The character of the vomiting, the age, the rapid wasting, palpation of tumor, and visible peristalsis justify exploration. The operation has become a simple one, and the results most gratifying. The six deaths on the service were all in cases in which the condition was not recognized until the infant was in an extremely critical condition.

Intussusception is the commonest cause of acute obstruction in children. Of 92 cases of acute obstruction in this report, 70 were due to intussusception. The commonest age is four to twelve months, and nearly all that report have been in the first two years; and one-half are between the ages of four and nine months. The cause is still extremely obscure.

The onset and symptoms, especially in the majority of cases seen, are acute and very marked. The onset is sudden, the pain paroxysmal and very severe. The child will cry out as with nothing else that is met with in children. We so often get the voluntary statement from the mother that in this attack the pain was different from anything else the child ever complained of. Also there is likely to be a very definite time set for the onset. For instance, the mother will state that at supper the child was well, but that at 8:15 he suddenly cried out with pain and vomited.

The vomiting is persistent and often projectile. It is at first a reflex vomiting from peritoneal shock, then obstructive, and is never absent in the acute cases, though as the disease goes on it may become less in amount. It may also become fecal, which shows complete obstruction rather than strangulation. There may be one or two loose stools after the onset, but after the lower bowel is emptied no feces or gas come through. There is mucus, then mucus and blood, then only blood.

The palpation of a tumor is a very constant finding and very important in diag-

nosis. This will be found early in most cases; and, as most cases start at the ileocecal valve, it is first felt in the right lower quadrant or right upper quadrant. Soon it crosses over and is generally felt in the left flank as a "sausage-shaped" affair four to six inches long. It may often be felt by rectum. As the intussusception crosses over from right to left the mass is under the liver and is hard to palpate. This is early in the disease, and careful palpation of the right upper quadrant must always be done in suspected cases.

The commonest mistake is to regard the vomiting, with bloody or mucous stools, as an enterocolitis.

The mortality for the 72 cases in this series is 41 per cent, but if recognized early and operated on promptly the death-rate is very low. Of the 30 deaths, only four occurred in those operated upon within twenty-four hours after the onset of symptoms. None of the cases in which the intussusception could not be reduced, and an enterostomy or resection was done, recovered.

In a series of 223 cases of acute appendicitis, the age distribution corresponds with that in series collected by other writers. That is, the disease is relatively rare in early childhood, and especially rare under two years of age. Cases occurring in older children—that is, over 10-12—present about the same problems as in the adult. The classical symptoms of pain, localized tenderness, vomiting, fever, and constipation, may be present, and the diagnosis is easy. But especially in younger children the localization of pain and tenderness, even though present, is hard to establish. The child, when asked, will nine times out of ten point to the umbilicus, and any attempt at palpation is likely to be unsatisfactory and unreliable. Vomiting is nearly always present, and, when associated with fever, constipation, and pain, is usually indicative of appendicitis. The pain may cause merely an irritability on the part of the patient, and this, with the vomiting and constipation, often causes the parents to give too frequent doses of castor oil. When this type of onset is seen from twenty-four to forty-eight hours after the castor oil has been given, it presents no difficulty in diagnosis, and has come to be called the "castor-oil appendix." In a series of 50 cases of ruptured appendix, taken at random, from the whole series, 35 per cent had had a vigorous cathartic given either by parents or physician before admission to the hospital. And this "home treatment" has played a large part in the high mortality rate of the disease.

The white count is of considerable help, as it is usually high, 15,000 to 20,000. The fever is likely to be 100° to 102°; the pulse elevated. A great deal may be learned, sometimes, by the thoracic type of breathing, and the disinclination of the child to move the trunk or legs.

Conditions in the chest, especially the pleurisy accompanying a right pneumonia, or pericarditis, with effusion, must be differentiated; also an early meningitis, and renal conditions, especially pyelitis. Intestinal upsets rarely have such severe pain or so high a blood count, but generally higher fever. It should be remembered always that a low count may mean only an overwhelming infection.

In any suspected or doubtful case, rest in bed with cleaning out by enemata should be tried, followed by operation if this treatment gives no relief, for it seems safer to intervene too early rather than too late.

General peritonitis occurs earlier and more frequently than in adults, and though the mortality is high in these cases, 33 per cent in 36 cases of ruptured appendix with general peritonitis, it is less than in adults.

In children under six to seven years old the outlook is poorer than in those of seven to twelve years. For all ages, without a general peritonitis, the mortality was 9 per cent. This is a high rate, and an earlier diagnosis would greatly reduce it.

Chronic appendicitis from the hospital point of view is largely, in fact almost entirely, a matter of history. The author believes it far safer to take out an occasional appendix that the pathologist says is normal than to discharge a child who

gives a history of one or more mild attacks, especially if the child has been seen in one of these attacks by its physician. There have been 195 such cases, with no deaths, and in the very large majority of cases it has been possible to follow up the later results have been very satisfactory.

Acute peritonitis in children over two years of age is practically always due to appendicitis. There are other conditions which may be mentioned, though the possibility of preoperative diagnosis is difficult.

In cases of pneumococcus peritonitis the diagnosis is generally made at operation, when a large amount of free, creamy pus is found, without the colon bacillus odor or signs of localization. To look for the appendix and try to remove it will generally destroy the only chance of recovery, so that the best means of treatment is merely to insert drains. In these cases the mortality has been over 80 per cent. In the other types the mortality is also high, 70 per cent in this series. The causative agent may be a variety of organisms: streptococcus, staphylococcus, and other pyogenic bacteria; also obstruction from internal strangulation; volvulus; extension from abscess about diaphragm; liver abscess; and occasionally gonorrheal salpingitis resulting from vulvovaginitis. Acute peritonitis in childhood is a grave condition no matter what the cause, and operation offers the only chance of cure. Under two years of age the mortality is exceedingly high.

Tuberculous peritonitis is a serious though by no means hopeless condition. From a surgical point of view the success that is often met with by a simple exploration is hard to explain, but it certainly exists. Of 35 cases operated on, 16 have died either while in the hospital or soon after discharge, a mortality of 45 per cent. The end-results of all these cases have not been completely obtained.

The negative von Pirquet skin reaction is of great value in diagnosis. The von Pirquet reaction in children is positive sooner or later in nearly all cases, but a negative reaction almost invariably rules out tuberculous peritonitis.

Operation is indicated in cases of doubt as to diagnosis, or to relieve obstruction. The patients are sometimes benefited thereby to a remarkable degree, but, the younger the child, the worse the outlook. The best treatment of all is general hygiene. Tuberculin is of doubtful value.

CHRONIC DUODENAL ILEUS.

It has been the experience of all operating surgeons to have found frequently dilatation of the duodenum when for this condition there was no obvious explanation. Bloodgood some time since advanced the theory that such dilatation might be due to obstruction caused by a pull upon the superior mesenteric artery making pressure upon the duodenum at its point of crossing, a concept which the anatomy of the parts would lead one to believe not entirely illogical.

Wilkie *(British Journal of Surgery,* Vol. IX, No. 34, 1921) to this condition, described as a potential one, illustrated by clinical cases, has given the name gastromesenteric ileus, or acute arteriomesenteric ileus, and states that it is now a well-recognized entity. He holds that whilst all cases of acute postoperative dilatation of the stomach may not be dependent on pressure on the third part of the duodenum by the superior mesenteric vessels, it is clearly established from a large number of operative and post-mortem observations that compression of this part of the duodenum is the commonest cause of acute duodenal and gastric dilatation, and that it is also proved that treatment based upon this view of the pathology of the condition is almost uniformly successful if resorted to promptly and thoroughly. The prone position with elevation of the pelvis, in conjunction with the stomach tube, has rendered a formerly grave and usually fatal complication an eminently curable one.

Most surgeons are in full accord with the at times almost miraculous effect of the

stomach tube. The acceptance of the prone position as a specific treatment is not so general.

In this consideration of the acute condition, the pathology of which Wilkie accepts without reservation, he naturally takes up the question of chronic obstruction and asks, "Does a chronic obstruction of the duodenum from mesenteric compression never occur?" If so, whether it gives rise to a recognizable clinical picture and whether it may or may not be the precursor of the acute postoperative condition? In answer to this last query he reports a case of death from acute dilatation in which the postmortem showed clearly great dilatation of the duodenum, which was found to enlarge abruptly at the crossing of the superior mesenteric artery.

The second case, which died with unusual rapidity, was one of duodenal obstruction associated with perforated duodenal ulcer—chronic ulcer. At first the autopsy showed the first, second and third parts of the duodenum up to the root of the mesentery were very markedly dilated, the mucosa being intensely congested, in striking contrast to the pale mucosa beyond. The rapid collapse and death are attributed by the author to the sudden escape into the peritoneal cavity of a large quantity of retained and toxic duodenal contents from a dilated duodenum, the symptoms being almost anaphylactic in character.

The next corroboration of his ideas on the subject was found in a case from "vicious circle" after gastroenterostomy. Here again the duodenum was found greatly dilated up to the crossing of the superior mesenteric artery; beyond the root of the mesentery the bowel was pale and empty.

In a fourth case reported the author recognized the condition of chronic duodenal obstruction during life and treated it at operation. The patient ever since she was a young girl had been bothered with flatulence after meals. Two years before reporting at the hospital she suffered from pain and distention after food. She was subject to attacks consisting of, first, severe headache, blackness before the eyes; then a feeling of nausea and epigastric discomfort; vomiting gave relief. For many months she was compelled to live on milk, tea, and biscuits. More solid food produced a sensation of distention sometimes almost amounting to bursting in the epigastrium, relieved only by vomiting.

On operation the stomach was distended with gas, the pylorus was widely dilated, admitting three fingers, the first part of the duodenum was enormously dilated, resembling a second stomach. This dilatation extended to where the superior mesenteric vessels crossed the duodenum. The dilated third part of the duodenum was anastomosed with the jejunum. The patient made an uninterrupted recovery and gained 21 pounds in ten weeks, and could eat ordinary food in entire comfort.

The author states that the third part of the duodenum is slightly compressed and narrowed as it passes under the root of the mesentery. Any factor which lessens the angle between the superior mesenteric artery and the aorta and vertebral column through which the duodenum passes will tend to cause a greater or less degree of duodenal obstruction. Congenital abnormalities leading to great dilatation have been reported. In cases met with in adult life it is needful to postulate some drag on the mesentery, which, acting intermittently, causes the "attacks" from which the patient suffers.

Two conditions producing such a drag have been demonstrated: one where the empty small intestines hang over the pelvic brim without resting on the floor of the pelvis when the patient is upright, or in the dorsal recumbent position, or where, from lack of tone of the abdominal wall, the natural support of the tissues is lost. When the empty small intestines hang over the pelvic brim, the mesentery is folded like a fan and the drag is a uniform one in the vertical direction. The other condition is that of congenital lack of fixation of the proximal colon, where the cecum and ascending colon prolapse into the pelvis

and exert traction on the mesentery in the line of the superior mesenteric artery; and it is this condition particularly which Bloodgood demonstrated and treated by resection of the proximal colon. In one case presenting the symptoms of chronic duodenal obstruction the author found that pressure upon the duodenum was exerted by the right colic artery which crossed the duodenum in an almost vertical direction. This type of obstruction has also been noted by Gregoire, by Villette, and by Duval, in cases with a floating proximal colon.

The salient feature of the condition is the dilatation of the first three parts of the duodenum up to the crossing of the mesenteric vessels. This dilatation is most pronounced in the first part of the dudoneum. Moreover, the wall of the duodenum is hypertrophied. The pylorus is usually dilated.

As to symptomatology, the author states the patient is usually a female, of spare build and of the visceroptotic type. She gives a history of stomach trouble for many years, usually since childhood. She will state that she has always had to be careful of what she ate, otherwise she suffered from epigastric pain and flatulence. Periodically she has had "bilious attacks," with nausea and vomiting. At the age of thirty or thereabouts the symptoms become aggravated. Epigastric discomfort and flatulence follow all but the simplest of meals. Walking and standing aggravate these symptoms; rest in bed gives a certain amount of relief. Some patients will volunteer that they have found that lying on the face or in the genupectoral position will give relief. In addition to the chronic flatulent dyspepsia so suggestive of a biliary condition, they suffer from what they term their "attacks." These are the typical popular "bilious attacks" consisting of, first, a day of headache and nausea and epigastric discomfort, sometimes amounting to actual pain; this is followed by vomiting, first clear, then bilious. This may last for a whole day, after which the patient feels completely relieved, although relatives remark that she looks hollow-eyed and has a tinge of jaundice. Such attacks tend to recur at intervals of four to five weeks, and are ushered in by constipation. In a few cases the nausea, headache, lassitude, and epigastric pain are the most pronounced symptoms, and vomiting is an occasional and late symptom. In such cases it would appear that a tonic pylorus resists the duodenal tension until at last it gives way; bile regurgitates, is vomited, and relief is obtained. The persistence of such symptoms over a prolonged period is apt to lead to a state bordering on, if not actually of, neurasthenia, when the subjective symptoms complained of multiply by analysis and make diagnosis more difficult.

When asked to indicate the site where pain is felt, the patient will refer to a point about one inch above the umbilicus, and usually slightly to the left of the midline. At this area some superficial cutaneous hyperesthesia may be detected. In some cases the seat of pain is located to the right of the midline. Firm pressure by the examining hand from below upward tends to relieve the pain. Should the duodenum be distended with gas at the time of examination, a definite tympanitic swelling may be made out above the colon.

The evidence of examination is variable, for, whilst definite retention of bismuth in the duodenum, and particularly in the most dilated first portion, is obvious in some cases, on the other hand no such delay has been observed in cases which at operation showed unmistakable signs of duodenal obstruction with dilatation.

As this condition is so often merely a complicating factor in visceroptosis, treatment by rest with the foot of the bed elevated, massage, feeding, and later an abdominal support, and suitable exercises, may reasonably be expected to relieve the earlier and less pronounced cases. For the severer cases, and those in which medical measures have failed to give relief, operative treatment must be considered. This will be of two types: it will be directed either to removing the drag on the mesen-

tery, or to short-circuiting the obstruction. If, at the operation, the drag is obviously due to ptosis of an abnormally mobile cecum and ascending colon, plication or fixation of these, or both measures combined, will be indicated and will give relief.

If the proximal colon is fixed and the drag is due to prolapsed small intestines or to some less obvious cause, or if the dilatation is so extreme as to have altered the relations of the third part of the duodenum, a short-circuiting operation is indicated and will undoubtedly give the most satisfactory result. The operation of duodenojejunostomy—making a lateral anastomosis between the third part of the duodenum and the first loop of jejunum—is both a safe and a satisfactory operation when the duodenum is dilated. With the transverse colon thrown upwards, the bulging third part of the duodenum rises into the wound. A transverse incision is made through the peritoneum covering it, and, by a little blunt dissection, the bowel is easily mobilized sufficiently to allow of an anastomosis clamp being applied. If a straight clamp cannot be satisfactorily used, a Brunner's angled clamp will prove useful.

Stasis in the duodenum, besides leading to toxic phenomena, such as the headache, nausea, and malaise associated with a bilious attack, may, by allowing bacteria to multiply, be a source of infection to its own wall and to adjacent viscera which communicate with its lumen. The association of duodenal ulcer with chronic duodenal ileus is too frequent to be a mere coincidence, and stasis in the duodenum must be registered as one of the predisposing causes of duodenal ulcer and as a factor which may determine the gravity of a perforation.

Progress in Therapeutics

Medical Therapeutics

Examination of the Blood in Diabetes Mellitus.

WILLIAMSON, in *The Practitioner* for September, 1921, calls attention to a method of blood examination which can be readily carried out by any intelligent medical practitioner (if he will pay strict attention to the details), even if he should have had no previous experience in analytical work. The test can be carried out in any consulting room, or even at the patient's bedside.

He first published this method of blood examination in 1896, and showed later that, in diabetes, the reaction was due to the excess of sugar in the blood of the patient. At that time clinical examination of the blood in diabetes was seldom made, and little importance attached to it; but as it is now regarded of practical value, this method of blood examination may be found useful as an indication of definite changes in the amount of blood-sugar, though it is not sufficiently delicate to indicate slight changes. It is not a method for estimating the exact percentage of sugar in the blood, but it is a means of demonstrating that the blood-sugar is definitely increased. In cases of glycosuria or diabetes, when the percentage of blood-sugar is normal, or but little increased, no reaction is obtained. When the blood-sugar is much increased a definite reaction will be obtained, and this will be more evident the higher the percentage of sugar. When the percentage of sugar is only very slightly above the normal, the reaction will be slight or indefinite, or no reaction will be obtained.

Only a very small quantity of blood is required—a large drop. The details of the test are as follows:

A small test-tube is employed, the diame-

ter of which should not be more than one-quarter of an inch. If the diameter of the test-tube is greater the test may fail. The small test-tube is washed out with water. The water is then jerked out of the tube, with the exception of one drop, which is allowed to remain at the bottom of the tube (filling the lowest quarter of an inch of the tube). The patient's finger is then pricked, and 20 cubic millimeters of blood are taken up with a fine capillary tube, placed in the tube, and mixed with the drop of water (the capillary tube of a Gower's hemoglobinometer, which is graduated for 20 c.mm., is a suitable tube to use). If the blood should adhere to the side of the small test-tube, it must be carefully shaken to the bottom. Then one cubic centimeter of a 1-in-6000 watery solution of methylene blue is added. (To measure this the 1-cc tube of a Southall's ureometer may be used.) Finally 40 cubic millimeters of liquor potassæ are added to the mixture. Then the contents of the small test-tube are well mixed by placing the finger-tip at the open end of the tube and slowly inverting the tube six or eight times. It is important to see that the blood does not remain at the bottom of the tube, but is mixed thoroughly with the other fluid. The mixture has a deep definite blue or bluish-green color. The tube is then placed in a water-bath, and the water kept boiling for four minutes. A beaker may be used for the water-bath, or, more conveniently, a very wide test-tube one inch in diameter, containing water at the bottom of the tube. The water may be kept boiling by an ordinary spirit lamp. At the end of four minutes, if the blood-sugar is decidedly increased, the fluid in the small test-tube will have lost its blue color and become of a brownish-yellow color (almost the color of normal urine). When the blood-sugar is not increased the fluid in the small test-tube retains its blue or bluish-green color after heating in the water-bath for four minutes. (As a control experiment a second small test-tube of similar size may be used, and into this is placed the same quantity of normal blood, with the same proportion of water, methylene blue solution, and liquor potassæ. This tube is placed in the water-bath by the side of that containing the diabetes blood. The fluid in the small test-tube containing the normal blood never loses its blue color; after heating in the water-bath for four minutes it may become bluish-green or slightly changed in tint, but is never decolorized. This second control tube is not necessary, though at first it is useful.)

The small test-tubes should be kept quite still whilst in the water-bath, since by shaking the decolorized methylene blue solution is readily oxidized by the oxygen of the atmosphere, and a blue tint may then return to the fluid which had been decolorized.

Williamson has used this blood test for twenty-five years, and has never obtained the reaction in any disease except diabetes, when the proportions of fluid just given have been used. In 1896 he examined the blood in one hundred cases of the most varied diseases, and has examined since that date the blood of numerous diabetic and non-diabetic individuals, but always with negative results except in diabetes mellitus.

Briefly stated, it is a test for indicating if the blood-sugar is markedly increased. (When the blood-sugar is only very slightly increased, the methylene blue solution may be altered in color, but the blue or greenish tint is not entirely removed.)

For some time he has tried the test in most cases of diabetes when first seen, and he found it of value as an indication of the severity of the diabetes. When a definite reaction with the methylene blue test is obtained the case is more severe and the prognosis more unfavorable. If no methylene blue reaction is obtained, the case is of a very mild form and the prognosis better. In cases in which no methylene blue reaction is obtained at first, often a decided reaction is obtained later; and the development of this reaction is then an unfavorable sign.

On the other hand, when by treatment the urine becomes free from sugar, often the methylene blue reaction can no longer be obtained in the blood, and this is a favorable sign.

Hyperthyroidism in Pregnancy.

In the *New York State Journal of Medicine* for September, 1921, GOETSCH states that about the first four months of pregnancy is the more favorable time for operation, since at this time the placental attachment is the firmest. A preliminary treatment with morphine and atropine is given, followed by gas and oxygen anesthesia with a very small amount of ether. The operation is carried out as expeditiously and with as little trauma as possible, and subsequent to operation morphine is again given in sufficient amounts to keep the patient quiet and to prevent contractions of the uterus. In one patient who had several small uterine fibroids there were transient crampy pains of a very moderate degree for a day or two, following which she was entirely comfortable. In the two remaining cases there were no symptoms at all referable to the uterus. There was no postoperative nausea or vomiting of any consequence, and the patients in twenty-four to forty-eight hours felt quite normal again, were able to take nourishment, and made a very rapid convalescence. All three patients gave birth to normal healthy babies and were themselves quite well during the puerperium.

The treatment of hyperthyroidism and pregnancy when the two conditions occur together is a difficult question and cannot be answered in a few words. The problems involved are many. The situation is much more serious when pregnancy and exophthalmic goitre occur together than in the case of an adenomatous goitre. The decision as to treatment must be made early, particularly in exophthalmic goitre, since the disease is progressive, and in the later months there is serious danger of acute hyperthyroidism, of miscarriage, or of premature labor, and even of death of the patient. Granted even that a healthy child might be born, we still have a serious case of exophthalmic goitre to treat in a nursing mother who would be a poor operative risk at this time. In a case of mild toxemia in exophthalmic goitre, and up to the fourth month of pregnancy, he feels that operative treatment of the goitre is a relatively safe procedure. In the severer grades of toxicity, however, abortion seems to be the proper treatment, both to prevent a serious form of exophthalmic goitre, a subsequent miscarriage, and even to save the patient's life.

In the case of adenoma of the thyroid gland, operation on the goitre is a far safer procedure and should preferably be carried out about the fourth month of pregnancy. Operation under these conditions cures the hyperthyroidism, makes the subsequent pregnancy and labor safe, and puts the mother in the best of condition for the nursing of the child. In brief, then, abortion should not be done as a general measure in all cases of hyperthyroidism. In cases of adenoma of the thyroid and in the mild form of exophthalmic goitre the conservative treatment should be followed, namely, operation on the thyroid gland in the earlier months of pregnancy, securing thus a safe pregnancy and a normal baby. Abortion should be restricted to those cases in which there is a marked increase in the signs and symptoms of hyperthyroidism of such a degree as to render operation unsafe, and in all the more toxic types of exophthalmic goitre.

Peritonitis.

In the *New York Medical Journal* of September 7, 1921, DEAVER states that there is a certain class of surgeons who boast of operating in every case of acute appendicitis no matter at what stage it may be. He has expressed his opinion of this procedure on numerous occasions, and here repeats that he who operates in a case of acute diffusing peritonitis after the first thirty-six or forty-eight hours of the onset of the peritoneal inflammation with no evidence of a localizing point is, in the majority of cases, not serving the best interests of his patients, nor his own best interest either, nor that of the profession. Operation at an indiscreet time in the presence of diffused peritonitis, and in the absence of a localizing point, liberates toxins which are the cause of

death in these cases. Although occasionally a patient may get well in spite of precipitate and ill-advised operation, the operative mortality in these cases is sure to be a high one. Success in this type of surgery is much a matter of luck—no matter how skilful the surgeon. Judgment is as indispensable to successful surgery as is skill.

In the presence of a circumscribed peritonitis with a localizing definite point of exquisite tenderness, due to an acutely inflamed, perforating or gangrenous appendix, operation can be undertaken, in the absence, of course, of constitutional or other contraindications, provided the proper technique is observed with respect to safeguarding the peritoneum from contamination by the proper disposition of gauze packings. After removal of the appendix the operation can be completed by providing for drainage and closing the wound up to the point of exit of the drainage, or by not closing the wound at all. In cases of abscess treated as open wounds which have already filled in, it is not his practice to suture. While this may and usually does lead to a subsequent hernia, he believes, nevertheless, that it is better to repair the deformity when the tissues have recovered their normal vitality.

In badly infected cases in which the peritoneum in the immediate neighborhood of the lesion is green and there is foul-smelling pus, the infected cavity should be surrounded by a rubber dam or oiled silk, and lightly packed with gauze; the wound is left open, but silkworm-gut should be carried through the margins of the wound and tied loosely to prevent protrusion of the intestines. The packing should be allowed to remain in for several days before being removed. If in addition to the cofferdamming, rubber drainage has been placed in the subhepatic space, or between the diaphragm and the liver, and a glass or rubber tube placed in the pelvis, the latter should be removed when aspiration yields a straw-colored fluid. When at the end of twenty-four hours the glass or rubber tube contains pus, if glass it should be replaced by one of rubber carried down into the pelvis through the glass tube and the latter gently withdrawn by revolving it around the rubber tube; if rubber, it should be left in. At the end of four to six days the rubber tube can be gradually withdrawn, cutting off the projecting end a little at a time until it is entirely removed. Before the cofferdam is removed it should be soaked several times daily with hypodermic salt solution and also during its removal. This policy is best to pursue in cases of peritonitis where the assumption is reasonable that the trouble has its origin in the appendix, or the lower abdomen; but where the symptoms indicate perforation of one of the larger viscera, such as the stomach or the duodenum, immediate operation is urgent. Peritonitis, the result of intestinal obstruction, gastric, duodenal, gall-bladder, intestinal, or colonic perforation, should be immediately operated upon if the condition can be recognized, which it usually can if the case is seen early. The longer the peritonitis exists, other things being equal, the more grave the outlook. Peritonitis is dangerous directly in proportion to absorption. It is not the inflammation of the peritoneum that is fatal, but the toxins which are absorbed from its products that cause the severe manifestations or perhaps death. It is true that severe peritonitis of several hours' duration often masks the situation so completely that differential diagnosis may be impossible. Nevertheless a carefully taken history will generally be of the greatest aid. By far the vast majority of cases of perforating gastric or duodenal ulcer give a previous history of digestive disturbance, while if the gall-bladder is at fault it is almost sure to have been preceded by indications of cholecystic disease, either calculous or non-calculous.

Postoperative treatment differs little from operative. Purgation here is as ill advised as before operation. The lower bowel can be emptied by a gently given enema. The upper bowel will take care of itself and will begin to empty as soon as nourishment is given, which can be done as soon as the passing of flatus indicates the subsidence of

the storm and peristalsis is restored. The quiescence of the intestine is a prime factor in bringing about early circumscription of the process by adhesions.

Too thorough operation in peritonitis very often spells death. Peritonitis is dangerous directly in proportion to the absorption. It is not the inflammation of the peritoneum that is fatal, but the toxins which are absorbed from the products of the inflammation that cause death. In cases in which it is necessary to prolong the fasting period beyond forty-eight hours nourishment must be provided by means of nutrient enemas, according to the judgment of the individual surgeon or practitioner—that is, adding nutriment to the salt solution.

Tonsil Operations in Children, with Especial Reference to the Sluder Method.

VOORHEES, in the *Medical Times* for September, 1921, reports as to the technique of the Sluder operation as carried out by most of the surgeons at the Manhattan Hospital. In the first place it differs in many important details from the technique used by Sluder in his demonstrations in New York during the month of June, 1921. The anesthetic employed by Sluder at that time was nitrous oxide gas only; Voorhees uses the gas-ether sequence almost entirely. Sluder does not use suction for the removal of blood; Voorhees does no enucleation under general anesthesia without suction and a field as nearly free from "low visibility" as possible. Sluder depends upon his wonderfully developed sense of touch while engaging and removing the tonsil; Voorhees works by sight chiefly, with touch as an auxiliary. Sluder does not usually examine the field of operation to see if there be anything left behind, but studies the tonsil carefully to make sure that removal is complete. Voorhees pays little attention to the tonsil, but scrutinizes the operated field with all diligence. Certain other differences obtain which are, perhaps, immaterial.

Voorhees emphasizes that in the above parallel it is not his intention to draw an invidious distinction. He does not pretend to do a better "Sluder" than the originator himself, but in operating upon from twenty-five to thirty-five tonsils daily a certain clarity and uniformity has been obtained which gives him the best results. It should be mentioned that the Sluder method is no fetish with Manhattan surgeons, for dissection and snare are practiced in all cases in which the former is not deemed advisable; but it is only fair to say that this occurs in a small percentage. Many adults can be "Sluderized" as well as children. He undoubtedly has some recurrences; there is no such thing as 100 per cent success, but they are few and usually appear to be the "working up" of infratonsillar tissue from the base of the tongue. Where this is seen after the Sluder enucleation it may be reëngaged with the guillotine or grasped with a tonsil fixation forceps and snared off. Surgeons are sometimes in error, Voorhees thinks, in mistaking the granulation tissue which fills in the tonsillar fossa after operation for tonsil tissue. Only rarely do the pillars stand out separately and distinctly when healing is complete. Usually they are indistinguishable from this new tissue which nature throws out just as she fills in a bone cavity or other hollow space.

As to the alleged increase of lung abscess after the Sluder method. Whether there is an actual or merely relative increase it is impossible to determine at this time. It has been ascribed both to "Sluderizing" and to the suction-pressure apparatus. Neither of these is responsible alone. In fact, as to the latter, it is quite impossible to blow clots, etc., into the open larynx under the primary anesthesia which he uses. Whatever gets through is aspirated when the patient is inhaling. Ether pressure and blood suction just about neutralize each other. Abscesses of the lungs come about most probably from inhalation of cheesy plugs when a tonsil is squeezed through the ring of the guillotine, but these plugs fall out almost as readily if the tonsil-grasping

forceps and snare are used. Suction of the crypts after the method of Hurd might be worth while preceding every enucleation by whatever method.

Experiences with Non-surgical Biliary Drainage.

FRIEDENWALD and MORRISON, in the *New York Medical Journal* of September 7, 1921, in describing the procedure state that with but few minor modifications the original plan of Lyon was carried out. The patient is instructed to fast, and with the exception of a glass of water, if this is desired, nothing else is allowed after 10 P.M. on the evening before the treatment is instituted. At 9 A.M. on the following day, after the teeth have been brushed thoroughly, the mouth cleansed, and throat gargled with an antiseptic solution, the tip of a freshly sterilized duodenal tube is placed in the back of the mouth and swallowed with a sip of water. After the tube passes into the stomach, lavage is practiced at first with water until the wash water is returned sparkling clear, and again with 250 cc of a 1-to-10,000 solution of potassium permanganate, as much as possible of which is immediately recovered. He has practiced lavage of the stomach when obtaining cultures only to avoid contaminations and when considerable mucus was present in the stomach. The patient is then ordered to lie on the right side and to swallow very slowly an additional twenty centimeters of the tube, totaling a distance of from seventy-five to eighty centimeters from the incisor teeth. This process should consume about twenty minutes. During this procedure swallowing efforts are repeated at regular intervals. A swallow of water frequently facilitates the passage of the tube into the duodenum. At times the passage into the duodenum is accomplished in ten minutes, and rarely does it consume longer than an hour. Before proceeding further it is necessary to determine whether entrance into the duodenum has been effected. According to his experience, the most reliable evidence in this respect is the change occurring in the color and character of the aspirated fluid. The fluid assumes a canary yellow color, which soon turns to an amber hue; and the character changes from a tenacious mucoid liquid to a clear, limpid, alkaline fluid which at times presents suspended floccules. Another method of value in determining this fact is the failure to withdraw any fluid swallowed, such as broth or milk. The so-called duodenal tug is obtained but rarely and cannot always be relied upon. The Roentgen ray is the method *par excellence*, but for obvious reasons cannot always be employed. Recently Palefski suggested inflating air slowly through the tube, and if it has passed into the jejunum the lower abdominal quadrant will become distended and tympanitic, and the patient will neither eructate nor complain of discomfort.

After being assured that the bulb has passed the pylorus, the tube is connected with an aspirating bottle and the duodenal secretion obtained. Under normal conditions the common duct sphincter is frequently found closed, and then but little or no bile can be aspirated; 50 cc of a warm sterile 33⅓-per-cent solution of magnesium sulphate is then injected into the duodenum. The duodenal tube is again connected with the aspirating bottle and the magnesium sulphate siphoned off. In a few moments bile mixed with the magnesium salt appears in the glass cannula inserted in the tube. At times it is necessary again to stimulate with half the amount of magnesium sulphate to secure a flow of bile. He has not infrequently restimulated with 50 cc of hot water or broth, with unusually good effect. The first bile obtained is considered common-duct bile, and requires from one to three minutes to collect, the amount varying from 10 to 20 cc. It is clear, light yellow in color, with but traces of mucus. Suddenly a transition occurs; the bile becomes darker and more viscid. This is gall-bladder bile and is collected in a separate receptacle, appearing normally in amounts of from 35 to 90 cc. Soon a third change occurs, when a thinner yellow bile

appears in the glass cannula, which is then drained into a third bottle; this is freshly secreted liver bile, which occurs normally in amounts averaging about 10 cc. When the aspirated fluid returns clear, which occurs after a variable period of time, 250 cc of warm Ringer's solution is slowly injected into the intestine to wash out any of the injected material that may have escaped into the bowel. This plan is followed for diagnostic purposes, but in the subsequent treatments no attempt is ordinarily made to segregate the various specimens of bile. Before treatment is instituted it is well to investigate and eradicate thoroughly all foci of infection, such as the teeth, tonsils, and paranasal sinuses, and on the other hand it is of great importance to note that the source of the focal infection may be located in the gall-bladder itself and that this method presents a means of thoroughly investigating this possible focus. Cultures are taken of the common-duct, gall-bladder and liver bile, before, during, and at the end of a course of treatment.

Before applying this method in the diagnosis and treatment of biliary duodenal lesions, a knowledge of the normal appearance of the bile and duodenal secretions is of primary importance. As has been pointed out, in the fasting state the common duct sphincter is normally closed and the duodenal content is free of bile. It is alkaline in reaction, pearly gray, fairly transparent, syrupy, and stringy in consistency, and contains a few suspected floccules. The bile flows intermittently, quite like the secretion of urine into the bladder through the ureters. This characteristic feature is especially manifested when the freshly secreted liver bile is being collected. The bile as it is obtained through a duodenal tube under normal conditions undergoes certain definite changes in color and viscosity, according to Lyon, first from a light lemon to a golden yellow, then to a deeper, richer, viscid, more syrupy golden yellow to dark brown, and finally to a uniformly light lemon yellow, thinner and less syrupy than either of the first two specimens. Microscopically, normal gall-bladder bile is free from pus cells and contains a few epithelial cells, bile crystals, and traces of mucus. Bacteriologically, no pathological organisms are observed. Chemically, the bile is alkaline in reaction and contains the biliary pigments—bilirubin and biliverdin; the biliary acids—glycocholic and taurocholic, cholesterin, lecithin, fats, etc.

They have also noted, as Lyon has pointed out, that in some instances a sudden turbidity in a clear bile will develop during drainage, which is due to the sudden passage of acid into the duodenum. The same condition may be produced artificially by adding dilute hydrochloric acid to bile in a test-tube. Lyon has also encountered clear bile in which an effervescence as well as a turbidity was produced on adding hydrochloric acid, similar to the reaction of acetic acid and calcium phosphate in the urine, and it has been suggested on this account by Lyon that we may possibly be dealing with calcium phosphate stones, potential or formed in the gall-bladder.

These authors conclude:

1. The method of biliary drainage, as instituted by Lyon, furnishes a valuable aid in the diagnosis of gall-bladder affection. It is particularly valuable in that it enables us to diagnose these conditions early before evidences of complications have manifested themselves.

2. It presents an important means of determining the presence of focal infection in the gall-bladder, a condition which may be of the greatest therapeutic and diagnostic value in obscure conditions.

3. While this method of treatment is still in its infancy and is as yet too new to draw conclusions regarding its end results, there can be no question that it furnishes us with a means of affording definite relief in certain biliary affections for which hitherto radical measures have been required. It is an extremely valuable aid in the treatment of catarrhal jaundice, biliary stasis, and gall-bladder infections, and is helpful in relieving the infection which may still remain following gall-bladder operations.

Superinfection in Syphilis in its Relation to Subtreatment.

In an editorial on this subject the *Journal of Laboratory and Clinical Medicine* for September, 1921, states that it is generally held that a person infected with the virus of syphilis becomes practically immune to a second infection; that, with the development of the initial lesion, a condition becomes established which makes it difficult or impossible to superimpose a second infection upon the one already present, and that this refractory state is maintained as long as an infection exists. Both human and animal experiences agree upon this, so far as they have been tested. In the absence of any evidence to the contrary it has been assumed that the principles contained in this conception of syphilitic immunity apply to treated as well as to untreated cases of syphilis, and many syphilographers have regarded the appearance of fresh lesions of the chancre type, under circumstances which would indicate a new infection, as the most conclusive evidence of the cure of the previous infection. But Jacobi suggested that the reaction to a second infection may be viewed more as the expression of any existing state of immunity than as evidence of the presence or absence of infection.

There are matters that need elucidation, and the need is accentuated by the fact, so stated by Brown and Pearce, that until the introduction of modern methods of spirocheticidal therapy, instances of so-called reinfection were comparatively rare, and interest in the subject was largely a theoretical affair. The point at issue, say Brown and Pearce, is not so much a question of the immunity conferred by syphilitic infection as it is the effect which certain therapeutics may have upon the resistance of infected individuals, and upon any spirochetes which may survive their action. This is the problem which Brown and Pearce have approached experimentally, for the purpose of discovering the effect of subcurative doses of arsphenamine and neoarsphenamine upon the resistance of infected animals to reinoculation.

These experiments consisted of the infection and treatment of two sets of rabbits—one with arsphenamine, the other with neoarsphenamine—after which they were reinoculated with luetic virus for the purpose of determining their susceptibility to a new infection. The experiments were rigorously controlled. Animals after being inoculated with the syphilitic virus and the lesions had developed were given subcurative injections of the two drugs, after which they were subjected to reinfection.

The effect of the treatment used in the experiments was as follows: Following the administration of the drugs the lesions began to regress, resolution proceeding somewhat more rapidly in the animals treated with neoarsphenamine than in those treated with arsphenamine. The first evidences of relapse were noted between fourteen and seventeen days after treatment. Clinical relapse among animals treated with neoarsphenamine was more delayed than among those treated with arsphenamine. In all the animals of both series, however, relapse occurred, which proves that the infection was active and the treatment used subcurative.

For the effects of reinoculation of infected (but untreated) controls, animals with the most advanced lesions were selected, while those showing least progress were used as controls. In but two instances out of ten inoculations did any lesion result which gave evidence of being due to syphilitic infection.

Reinoculation of treated animals, on the other hand, gave different results—*i.e.*, all but two developed perfectly typical chancres associated with lymphadenitis. It is of interest to note that the relapses of the original lesions occurred in eight of the ten reinoculations at about the time when the superinfection lesions became well established.

The results of the treatment and reinoculation as a whole are stated as follows: Of the animals treated with arsphenamine and then reinoculated, the original lesions were completely resolved in but one instance, and relapses occurred within thirty-three days in four of the five animals. By reinoculation

characteristic chancres were produced in all the animals of the group. The results with neoarsphenamine were not so uniform. In two animals the lesions were quickly resolved. Clinical relapses occurred in all but one animal in the group at from fourteen to twenty-four days after treatment. Characteristic chancres were produced by a second inoculation in three of the five animals.

The results of the whole experiment stated in summary are: (1) That the treatment employed was insufficient to cure any of the therapeutic controls; (2) that the infected (and untreated) controls were highly refractory to a second inoculation; (3) that the treated animals were highly susceptible to a second inoculation, and though not cured of their original infection reacted to the second inoculation with the formation of lesions indistinguishable from primary sores; and (4) that in certain instances the treatment given had rendered infected animals more susceptible to infection than the normal controls.

One wonders after reading these results what effect on reinoculability mercury has, whether given alone or in conjunction with arsenic. This is suggested by the statement that evidences of reinfection were less frequent before the advent of arsphenamine therapy. One also wonders what influence upon the present generation of syphilitics the too general undertreatment is having; and whether in the campaign for education of the laity some emphasis should not be placed on the fact that undertreatment of syphilis is perhaps as serious an affair as none, and that a few doses of arsphenamine give little but a false sense of security.

Ventilation, Weather, and the Common Cold.

PALMER, in the *Journal of Laboratory and Clinical Medicine* for September, 1921, states that the following conclusions appear justified from the evidence:

1. Respiratory sickness is no greater in a window-ventilated school-room kept around 59 degrees than it is in a room where the temperature is 64 degrees.

2. Respiratory sickness is greater in fan-ventilated rooms, such as are represented in this study, than in window-ventilated rooms, even though there is not more than a degree difference in temperature, and the fan rooms are more spacious.

3. It is low temperature rather than chemical purity of the air which conveys the sensation of freshness.

Pylorospasm in Adults: Its Medical and Surgical Treatment.

FINNEY and FRIEDENWALD, in the *American Journal of the Medical Sciences* for October, 1921, state that pylorospasm is a complex nervous phenomenon the exact etiology of which has not been satisfactorily established. Experimentally the fact has been definitely demonstrated that pylorospasm may be produced in rabbits by stimulation of the vagus and inhibited by stimulation of the splanchnics. That there is a definite association between this condition and the endocrine system is indicated by the fact that the spasm may be brought about by injection of certain extracts of the thyroids and parathyroids and inhibited by injection of an extract of adrenals. On the other hand there is but little question that changes in tonus or peristalsis are of great importance in the production of this phenomenon.

Pylorospasm may exist in one of three types: the neurotic, the irritative, and the reflex forms. In the largest percentage of cases this condition is secondary to some irritative lesion in the stomach or is reflex from disease of some other organ. Many of these cases are promptly and completely relieved by removal of the cause—chronic appendix, gall-stones, etc. There exists, however, a purely neurotic form without any demonstrable lesion.

The condition can usually be recognized clinically by a careful study of the case. In the majority of the cases slight if any pathological changes may be demonstrated about the pylorus at operation, as the general anesthetic usually completely relaxes the pyloric spasm. In advanced cases one may observe varying grades of hypertrophy

in the pylorus and the pyloric antrum of the stomach.

The symptoms of pylorospasm are rather characteristic. These consist of pains of the hunger type appearing two or three hours after meals, which are relieved by emptying the stomach of its contents as well as by the ingestion of food; of contractions of the stomach leading to tumor formation, which disappear as the spasm relaxes; of symptoms of intermittent stagnation and hyperacidity.

The greatest aid afforded in the recognition of pylorospasm is by roentgenology, by means of which the nervous as well as the organic forms may usually be differentiated.

In the treatment of this affection medical measures should always be given a careful trial; if it be secondary to other abdominal conditions the primary disorder should, as far as possible, be overcome before treatment is directed toward the spasm. The treatment consists of overcoming the primary neurasthenia. This is most satisfactorily accomplished by means of dietetic and hygienic measures. During an attack the best results are obtained by means of hypodermic injections of morphine with atropine following a thorough lavage of the stomach. The drug most useful in the treatment of this affection is atropine, given in full doses. When medical measures fail to give the desired relief, pyloroplasty theoretically is the operation of choice and practically gives most satisfactory results.

The Heart Irregularity Called "Sinoauricular Block."

SMITH, in the *American Journal of the Medical Sciences* for October, 1921, states that "sinoauricular block" is not as rare as the paucity of literature on the subject would lead one to believe. It was clinically suspected, with some degree of certainty, in scores of healthy young men in military examinations; it has been cardiographically proved to be present fourteen times in the last ten months in his experience.

"Sinoauricular block" can be clinically suspected in a person whose pulse is irregular as the rate returns to normal after exercise and who is free from symptoms and signs of circulatory fault. The condition is to be differentiated from sinus arrhythmia and from premature contractions; in sinus arrhythmia the rate increases on inspiration and decreases on expiration, the irregularity disappearing when the breath is held. Respiration has no effect on the irregularity called "sinoauricular block." Premature contractions may be associated with other evidence of cardiocirculatory fault; they disappear on exercise and do not usually recur for several minutes following increased physical effort; they are especially noticeable when the patient is at physical rest or falling asleep. A person whose heart exhibits premature contractions (particularly if they are of ventricular origin) is usually conscious of the irregularity; the intermittency of "sinoauricular block" produces no such subjective symptoms.

"Sinoauricular block" is not associated with nor is it the sequel of any one definite type of infective process.

It is not necessarily dependent upon nor secondary to an infective process, as it occurs in individuals who are well.

In a rapid heart it was recorded within twenty minutes following the hypodermic administration of strychnine and atropine.

It has been observed in persons who had no other clinical evidence or physical signs of cardiocirculatory disturbance.

"Sinoauricular block," in certain persons, can be made to appear following physical exertion, mental excitement, or emotional strain; it may also follow the administration of drugs; it is therefore likely due to a change in nerve control of the heart.

In seven of the eight patients whose electrocardiographic records are here shown there was no other evidence of cardiac disturbance in the graphic records.

The premises above enumerated lead to the deduction that "sinoauricular block" is not a pathological condition, but is, in all likelihood, a physiological manifestation in

certain hearts. As such its detection does not require drug interference nor does it furnish an indication for modifying the individual's accustomed manner of living.

Treatment of Premature Loss of Hair.

In the *New York Medical Journal* of October 19, 1921, MacKee and Andrews make the following suggestions. They attach numbers to their prescriptions and discuss them by number afterwards.

I. OIL LOTION AND BRILLIANTINE.

Olei ricini, 2 drachms;
Dactylis or olei myrciæ, 5 drops;
Spts. vini rect., 80 per cent, q. s. ad 4 ounces.

M.

II. MERCURY OIL SUSPENSION.

Hydrargyri ammoniati, 20 grains;
Hydrargyri oxidi rubri, 10 grains;
Olei rosæ ger. or olei myrciæ, 10 minims;
Olei olivæ, ½ ounce;
Liquidi petrolati, q. s. ad 2 ounces.

M. and S.: Shake well before using.

III. SULPHUR OIL SUSPENSION.

Zinci sulphatis, 10 grains;
Sulphuris præcipitati, ½ drachm;
Quininæ sulphatis, 15 grains;
Ol. rose gr. or olei myrciæ, 10 minims;
Olei olivæ, ½ ounce;
Liquidi petrolati, q. s. ad 2 ounces.

M. and S.: Shake well before using.

IV. MERCURY OINTMENT (MILD).

Hydrargyri ammoniati, 1 drachm;
Olei amygdalæ amaræ, 1 minim;
Adeps lanæ, 2 drachms;
Petrolati albi, q. s. ad 1 ounce.

M.

V. MERCURY OINTMENT (STRONG).

Hydrargyri ammoniati, 1 drachm;
Hydrargyri oxidi rubri,
Acidi salicylici, ää 15 grains;
Olei amygdalæ amaræ, 1 minim;
Adeps lanæ, 2 drachms;
Petrolati albi, q. s. 1 ounce.

M.

VI. SULPHUR OINTMENT.

Sulphuris præcipitati, 1 drachm;
Acidi salicylici, 15 grains;
Olei amygdalæ amaræ, 1 minim;
Adeps lanæ, 2 drachms;
Petrolati albi, q. s. ad 1 ounce.

M.

VII. STIMULATING LOTION (BRUNETTE).

Resorcin, 2 drachms;
Betanaphthol, 10 grains;
Spts. vini rect., 2 ounces;
Aquæ, q. s. ad 8 ounces.

M.

VIII. STIMULATING LOTION (BLOND OR BRUNETTE).

Capsicine, 1 grain;
Tincture cantharides, ½ ounce;
Chlorali hydrati, 1 drachm;
Quininæ hydrochloridæ, 15 grains;
Spts. vini rect., 2 ounces;
Aquæ, q. s. ad 8 ounces.

M.: Filter.

IX. MERCURY LOTION (BRUNETTE).

Same as VII, with the addition of:
Hydrargyri chloridi corrosivi, 3 grains.

X. MERCURY LOTION (BLOND).

Same as VIII, with the addition of:
Hydrargyri chloridi corrosivi, 3 grains.

XI. SULPHUR LOTION (BRUNETTE).

Same as VII, with the addition of:
Zinci sulphocarbolatis, 1 drachm.

XII. SULPHUR LOTION (BLOND).

Same as VIII, with the addition of:
Zinci sulphocarbolatis, 1 drachm.

XIII. OIL MERCURY LOTION.

Hydrargyri chloridi corrosivi, 1 grain;
Chlorali hydrati, 1 drachm;
Spiritus acidi formici, 2 drachms;
Olei amygdalæ dulcæ, 3 drachms;
Aquæ calcis, q. s. ad 4 ounces.

M.: Emulsify with quillaja. Add perfume or deodorant to hide odor of formic acid.

XIV. OIL RESORCIN LOTION.

Hydrargyri chloridi corrosivi, 1 grain;
Resorcin, 1 drachm;
Olei amygdalæ dulcæ, 3 drachms;
Aquæ calcis, q. s. ad 4 ounces.

M.: Emulsify with quillaja.

XV. SOLID SHAMPOO.

Thymol, ½ drachm.
Saponis mollis, q. s. ad 4 ounces.

M.

XVI. LIQUID SHAMPOO.

Thymol, ½ drachm;
Sodii carbonatis, 10 grains;
Tinct. saponis viridis, q. s. ad 8 ounces.

M.

XVII. MERCURY SHAMPOO.

XV or XVI, with addition of:
Hydrargyri chloridi corrosivi, 2 grains.

XVIII. SULPHUR SHAMPOO.

XV or XVI, with addition of:
Sodii boratis, 10 grains;
Sulphuris præcipitatis, 20 grains.

XIX. TAR SHAMPOO.

XV, XVI, XVII, or XVIII, with addition of:
Olei cadini, ½ drachm.

XX. DRYING POWDERS.

Pulveris orris, 7 drachms;
Sodii boratis, 3 drachms;
Amyli (rice), 2 drachms;
Ol. violet, q. s. ad pleasant odor.

Some people prefer perfume in the hair lotion or pomade; others desire a pleasant odor without perfume, while others object to the addition of perfumes and deodorizers. For men, six drops of oil of bay or six grains of eucalyptus may be added to eight ounces of hair lotion; for women, five drops of dactylis or two drops of oil of violet for a similar amount of lotion. Ointments and suspensions may be made pleasanter by the addition of one or two drops of bitter almond oil, or two grains of eucalyptus, to the ounce. The thymol in the shampoos provides an agreeable odor, so no addition is necessary for this purpose.

It is well to see that the prescriptions are properly filled. The ointments made by some druggists are a disgrace to the art. Many patients prefer oily suspensions to ointments, because the former can be quickly spread over the scalp by means of a medicine dropper. Also in this way less grease will be deposited on the hair.

Sulphur and mercury must never be used at the same time, otherwise a deposit of black sulphide of mercury will form on the hair, scalp, forehead, and fingers. If one happens to use a hair lotion containing sulphur, the shampoo, oil suspension or ointment, if employed by the same patient, must not contain mercury, and *vice versa*. In instances where oil is especially indicated—dry hair and scalp—it is preferable to use an ointment or oily suspension and a lotion rather than combine the two, especially in women. If the two are combined and the lotion is frequently used, the hair is likely to become too oily in a few days.

Alopecia Symptomatica.—After loss of hair from acute diseases, such as influenza, the hair will usually be restored to normal within a few months, but it is unwise to depend upon spontaneous recovery. The daily application of prescription VIII will usually suffice. If the hair is dry prescription I may also be used, or prescription XIII may be used alone. The hair should be washed once weekly with Castile soap.

In the more stubborn cases, associated with nervous exhaustion, prescription VII or VIII will be found more efficacious. The patient should be urged to use one of the oil suspensions or ointments, two or three times weekly, or at least the night before the shampoo.

High-frequency electricity, sunlight or ultraviolet treatment, and massage are indicated. It is essential that everything possible be done to improve the general health of the patient.

Alopecia Idiopathica. — If the scalp is bald there is no use in attempting to restore the hair. In early cases massage, sun bathing, high-frequency treatment, and ultraviolet therapy will help to delay the process. Prescription VII or VIII should be used daily. If there is evidence of a combination of idiopathic and seborrheic alopecia, it is preferable to use prescription IX, X, XI, or XII. The hair and scalp should be kept slightly oily with vaselin or prescription I, or any of the suspensions or ointments may be used. Prescription XIV will be found useful in uncomplicated idiopathic alopecia. The scalp may be washed once weekly with Castile or tar soap.

Alopecia Senilis. — The treatment is the same as that advised for alopecia idiopathica.

Gray Hair.—Gray hair may be senile, or if presenile it may be hereditary or due apparently to a low tone of the nervous system or poor local circulation. There is no cure for gray hair. The indications are to improve the patient's general hygiene and general health, special attention being given to the nervous system. Locally, all evidence of disease of the scalp should be removed if possible. Massage, stimulating topical remedies, ultraviolet therapy, sun bathing and high-frequency therapy are useful to effect a good circulation.

Alopecia Areata.—There is a difference of opinion among dermatologists as to the necessity of treating alopecia areata. Some aver that there is either a spontaneous recovery or no recovery—in other words, that treatment is practically useless. This is a minority opinion. We are inclined to agree with this opinion in so far as it concerns

alopecia totalis or alopecia universalis, but not in common alopecia areata.

If there are one or a few more patches of baldness, the individual patches, if on the scalp, may be painted with pure carbolic acid; as soon as the treated area has turned white, alcohol may be applied. If on the face, alcohol should be applied before the white color appears. These applications may be repeated once or twice a week, depending upon the degree of reaction provoked. All evidence of reaction should disappear before making the next applica tion. Tincture of iodine or a twenty-five-per-cent solution of resorcin, or of almost any irritant, may be employed for the purpose of producing the desired vascular reaction.

Ultraviolet therapy appears to be especially efficacious. It is a good idea to attend to the patient's general health and to eliminate focal infections and conditions that might irritate the nervous system, such as eye-strain. In generalized cases it is customary to depend upon ultraviolet radiation.

Alopecia Seborrhœica.—Dry stage: Prescription VII or VIII should be used daily, together with frequent applications of one of the oily suspensions or ointments. If preferred prescription XIII or XIV (lotion containing oil) may be used. Shampoo once weekly with prescription XV, XVI, XVII, or XVIII. Massage is contraindicated. If the case is very stubborn try prescription IX, X, XI, or XII.

Waxy Stage.—Daily use of prescription IX, X, XI, or XII. In addition we urge the frequent use of the oily suspensions or ointments. Oily suspensions and ointments are more efficacious than are non-oily lotions. Shampoo once weekly with prescription XVI, XVII, or XVIII. At times tar soap or prescription XIX seems more efficacious. Massage is contraindicated, at least until all evidence of local disease has disappeared. In stubborn cases sun bathing, ultraviolet light treatment, or high-frequency treatment is of value. Painting the scalp with tincture of iodine, or the frequent use of a ten-per-cent iodine ointment, may be more efficacious than the remedies quoted *supra.*

Oily Stage.—Sulphur and mercury are the principal topical remedies. Prescription IX, X, XI or XII should be vigorously applied daily. In men the oily suspension II or III, or the ointment V or VI, should be used three times weekly. If women refuse to use the oily remedies so often, have them apply such remedies the night previous to the shampoo. The shampoo must be very thorough, using prescription XVII, XVIII, or XIX. The hair may be washed once weekly, or in case the oil collects rapidly, twice weekly.

These cases are always stubborn. As soon as the scalp appears clean, massage should be instituted. Ultraviolet therapy, sun bathing and high-frequency treatment are of value. Sometimes painting the scalp with tincture of iodine is useful.

The Prevention of Simple Goitre in Man.

MARINE and KIMBALL, in the *Journal of the American Medical Association* of October 1, 1921, state that to their knowledge the prevention of human goitre was not attempted on any large or practical scale until 1917, when they began work with the school population of the city of Akron, although in Cleveland it had been strongly urged and had been used by some physicians for several years. Briefly, the method as applied to man consisted in the administration of 2 gm. of sodium iodide in 0.2-gm. doses, distributed over a period of two weeks, and repeated each autumn and spring. This amount of iodine is excessive, and far beyond the needs of the individual or of the ability of the thyroid to utilize and store it. One gramme distributed over a longer period would be better. The form or mode of administration of iodine is of little consequence. The important thing is that iodine for thyroid effects should be given in exceedingly small amounts, and it is believed that most of the untoward effects recorded are due to the

excessive doses employed, or, more concretely, to the abuse of iodine.

The results of their two and one-half years' observations on school-girls in Akron are as follows: Of 2190 pupils taking 2 gm. of sodium iodide twice yearly, only five have developed enlargement of the thyroid; while of 2305 pupils not taking the prophylactic, 495 have developed thyroid enlargement. Of 1182 pupils with thyroid enlargement at the first examination who took the prophylactic, 773 thyroids have decreased in size; while of 1048 pupils with thyroid enlargement at the first examination who did not take the prophylactic, 145 thyroids have decreased in size. These figures demonstrate in a striking manner both the preventive and the curative effects. Klinger has recently (1921) reported even more striking curative results in the schoolchildren of the Zürich district. He worked with school populations in which the incidence of goitre varied from 82 to 95 per cent, while their maximum incidence in Akron was 56 per cent. With such a high natural incidence of goitre, his observations necessarily deal more with the curative effects. Thus of 760 children, 90 per cent were goitrous at the first examination. After fifteen months' treatment with from 10 to 15 mg. of iodine weekly, only 28.3 per cent were goitrous, of a total of 643 children reëxamined.

The foregoing results were obtained in adolescents. There are two other periods in life when simple goitre frequently develops, namely, (1) in fetal life, and (2) during pregnancy. While the thyroid enlargements developing around the age of puberty are more common, they are not more important than those developing during pregnancy and fetal life. The higher birth mortality of infants with congenital goitre is well known. The thyroid enlargement of both mother and fetus may be prevented by giving 2 gm. of sodium iodide, or its equivalent in iodine in any other form, during the first half of pregnancy.

The dangers of giving iodine, in the amounts indicated, to children and adolescents are negligible. Exophthalmic goitre and iodism are the two important conditions to be looked for. No case of exophthalmic goitre developed in the series reported by Klinger or by Marine and Kimball, although in both instances such cases were carefully looked for. Much has been written of iodine-exophthalmic goitres, but a study of the case reports reveals the fact that they resulted from the use of excessive (according to physiologic standards) amounts of iodine, or of desiccated thyroid. In adults the possibility of aggravating a mild exophthalmic goitre or even the production of the syndrome in susceptible individuals must be considered. Again, the risk is slight. Iodine should not be given in any frank case of exophthalmic goitre unless the patient can be daily observed, and then it should be administered only in milligramme doses. Iodism was observed in eleven cases among the schoolchildren of Akron during the two and one-half years of observation. Most of these cases were very mild, and the girls did not stop the treatment. Klinger did not observe a single instance in sixteen months' observation on more than 1000 children, although iodism was carefully looked for.

Modern Methods of Conducting Labor.

In the *Journal of the Missouri State Medical Association* for October, 1921, GRAY states that there is a difference between a patient saying she is worn out, or tired, and uterine exhaustion. A woman may say that she is so worn out that she cannot have another pain. A woman may complain of complete exhaustion, but if her pulse is between 70 and 80, full and regular, that woman is not exhausted, but tired. If the uterus makes no pressure downward, and the presenting part does not make pressure against the cervix or perineum, then she is having uterine exhaustion.

There is one condition in which we can use pituitrin before the cervix is fully dilated, and that is when the water sac is unruptured, and cervix is soft and dilatable. The great danger when the water

sac is ruptured is that the continuous pains will be reduced from, say, five minutes to one or one-half minute, but the secret of success in its use at this time is the size of the dose.

Do not give more than three to five drops with an undilated cervix, and DeLee gave good advice when he said that he never gave pituitary extract before dilatation of the cervix unless he had a can of ether in the other hand. Happily this violence of pain can be reduced by inhalation of ether.

During its third year's use there were reported 24 ruptured uteri, and no doubt there were many more unrecognized and unreported. In too large doses it is capable of rupturing the uterus. This is especially true in malposition, say occipito-posterior, face, brow, transverse and breech presentation. Then, too, a continuous pounding of the head on one spot in the vagina will cause traumatism and necrosis. If the cervix is not dilated it will cause laceration of the cervix. Indeed many have been lacerated into the peritoneum cavity.

He believes this drug to be very efficient in placenta prævia. After packing the vagina thoroughly, the patient will frequently bleed into the uterus sufficient to destroy her life. If given two or three drops every hour there will be sufficient contraction to prevent this.

Again he calls attention to its abuse in cases in which there is high blood-pressure. In uremic cases in which they have a blood-pressure of say 145 or 150 we know that they are on a precipice ready to be hurled over at any moment; pituitrin in 1-cc dose raises the blood-pressure six to eight points, and this may be sufficient to cause a convulsion; therefore, in cases of high blood-pressure, if used at all, it should be given in small doses, often repeated, rather than in one large dose.

To sum up Gray does not believe we are ever justified in giving a large dose, say 1 cc, previous to birth of child. Give small doses oft repeated if necessary.

It is a remedy superior to all others known in checking and preventing postpartum hemorrhage; superior to ergot because of its rapid effect. One cannot hope to get effects from ergot in less than ten to twenty minutes. Pituitrin is much more rapid. If given into a vein it will have effect in less than twenty seconds. If given direct into a muscle, say deltoid or biceps, it will have effect in one-half to one minute. If given subcutaneously it has results in three and one-half to four minutes.

The next means to which he refers is nitrous oxide and oxygen, which is a god-send to expectant mothers. It is safe and effectual. He has used it 600 times from five minutes to five and one-half hours, with no ill effects.

This method was adopted for obstetrics about the year 1910 by McKerson. When carried to the analgesic stage, in Gray's opinion, it is safer for both mother and babe than any other anesthetic.

The Treatment of Eclampsia.

HIRST, in the *New York Medical Journal* of October 5, 1921, states that there are four therapeutic principles to be considered, namely, elimination, the sedative treatment, measures to reduce blood-pressure, and if the patient is not yet delivered, the operative treatment. He is not a fanatical adherent of any of these principles, but employs them all as follows:

It has been contended that elimination is not scientific because it has not been demonstrated that the toxins of eclampsia are eliminable by the only agents at our command, the skin and the bowels, the kidneys being temporarily out of commission. But this objection ignores the fact that in every case of eclampsia the patient has an acute parenchymatous nephritis and is uremic as well as toxic from the original cause of the nephritis. He employs diaphoresis and catharsis, therefore, energetically, sweating the patient in a sweat cabinet every four hours for thirty minutes and supplying the subtracted fluid by proctoclysis—a quart of water with an ounce of bicarbonate of soda (to combat acidosis) by the drop method midway between the sweats. He has had no experience with the

method proposed by Davidson, of Seattle, of filling the stomach through a stomach tube with large quantities of water, one thousand to fifteen hundred cubic centimeters at regular intervals. He tried it once but got alarming symptoms of acute dilatation of the stomach and cardiac embarrassment. He thinks, however, that it should be tested more thoroughly.

In common with most physicians he always begins the treatment of eclampsia by washing out the stomach to remove undigested food, and uses the stomach pump to instil a purgative. He has been in the habit of using two ounces of castor oil with two drops of croton oil. If the patient is able to swallow, this is supplemented by repeated doses of concentrated Epsom salt solution every half-hour until two ounces are taken. If the stomach pump is not used for any reason, a quarter of a grain of elaterium on the back of the tongue replaces the castor oil, and if there is much edema, twenty grains of compound jalap powder is administered. Directly after the gastric lavage the colon is also washed out to remove fecal masses which might add their quota to the general toxemia, and to prepare the rectum for the proctoclysis.

Anesthetics are not used; morphine alone is depended upon, but is only administered if the convulsions are violent and frequent. It seems injudicious to give morphine to a comatose patient in whom convulsions occur only at long intervals. He does not understand the 8.9-per-cent mortality in 829 cases quoted by the advocates of the Stroganoff treatment. He says that he could not obtain such results by this treatment alone and does not know of any of his colleagues in this country who do.

Measures to reduce blood-pressure must have a place in the treatment of eclampsia, for the mere excess of systolic pressure may be a cause of the multiple apoplexies in many organs which are often found post-mortem. The following means are found most efficacious: An initial dose of ten minims of veratrum viride and the subsequent administration of one hundredth of a grain of nitroglycerin every four hours. Venesection is done routinely to the extent of sixteen ounces if the systolic pressure is at or above 180. Sweating is almost always followed by a decided depression of systolic pressure, and is therefore doubly useful. If the woman is not delivered, puncture of the membranes brings the blood-pressure down in the most remarkable manner. He has seen it fall a hundred points in three minutes, from 236 to 136. Diastolic pressure should be carefully observed. If the pulse pressure is low the energy of the treatment should be diminished; it may be necessary to drop all treatment of eclampsia and to substitute stimulation for it temporarily.

The operative treatment of undelivered women is a matter of great interest. It seems logical; the woman is eclamptic because she has a fetus *in utero;* clinicians often see convulsions cease when the woman is delivered. Acting on this apparently logical idea he adopted the immediate operative treatment three separate times, but the mortality always rose; and his experience is not unique. Peterson's collection of more than one thousand cases, although made to support an argument for this procedure, showed a mortality of about twenty-five per cent. He reserves the operative treatment by Cæsarean section for those cases in which there have been preliminary elimination, sedative treatment, measures to reduce blood-pressure, without progress in labor and without improvement. Although reserved for the worst cases, therefore, with preliminary treatment as described, Cæsarean section has given surprisingly good results.

The Therapeutic Uses of the Anterior Pituitary Gland.

Scott and Broderick, in *The Practitioner* for October, 1921, state that the conditions due to abnormal anterior pituitary secretion naturally divide themselves into those of pre-adolescence and post-adolescence. The former are chiefly defects of growth and development, and the latter chiefly of function. The functional failures

of adult life are often the result of unrecognized developmental faults in youth. In early adults the urge of life and the call for action are so intense that for a time endocrine deficiency is almost obscured, but the poor material in the machine shows itself before long and power partially fails. This points to the importance of careful observation in childhood. We see children developing in a hesitating way, both in mind and body, not going straight. We are too apt to think of it as character-deficiency, or we call it laziness or wilful stupidity, but it is nearly always endocrine deficiency.

We see the extreme proof in the treatment of the cretin by thyroid, but these endocrine disharmonies are at work, unseen generally, and often very slight, through most of childhood's years. Much has been done by the thyroid treatment, but still more would be accomplished if we realized that thyroid and anterior pituitary deficiency generally exist together.

The thyroid perhaps tells more on the brain and nervous development and the pituitary on the osseous and the sexual, but no fast line can be drawn between the two influences. We see often the slow developing, dull adenoid type improve rapidly under thyroid as far as intellect is concerned, but the body and limb growth falters. Here the combination does excellently well. In girls especially, the intellectual life may be active and even brilliant, but the uterine and ovarian development are almost standing still, unobserved and untreated; these girls grow up sex failures. Never advancing beyond rudimentary growth of uterus and ovaries, they swell the ranks of the disappointed, the sterile, and the nervous invalids. They often begin to menstruate at thirteen or fourteen, and go on for a year perhaps; then comes irregularity or complete cessation. This state of things, when not due to manifest anemia, points almost conclusively to hypopituitarism, and can be helped wonderfully by anterior pituitary medication. It should be given in good doses for two or three years, or till healthy menstruation is well established. Under its influence the pelvic organs develop as nature demands.

It is well known that children of both sexes, who have enuresis, often get well under thyroid, but there are failures also, and in these the combination of the two gland extracts will often succeed. Failures of normal skeletal growth and osseous development especially demand pituitary.

It should be an axiom, always in our minds, that endocrine deficiency is very rarely single, and, further, that the whole field must be considered before we can expect success in treatment.

The Influence of Phenylcinchoninic Acid and the Ethyl Ester of Paramethylphenylcinchoninic Acid on Renal Excretion.

MYERS and KILLIAN, in the *Journal of Pharmacology and Experimental Therapeutics* for October, 1921, states that phenylcinchoninic acid (cinchophen) and the ethyl ester of p-methylphenylcinchoninic acid (tolysin) exercise a general stimulating effect on kidney excretion. This action is most marked in the case of uric acid, but it is possible to demonstrate a similar action in the case of urea and chlorides, provided cases are selected with a slightly high blood concentration of these substances.

Vaccination Treated Locally with Castor Oil.

MYLES, in a letter to the Editor of the *Journal of the Royal Army Medical Corps* for November, 1921, states that he has found the following procedure very useful:

Take some cotton-wool and dab over the whole inflamed area with castor oil. Take a piece (square) of boric lint and cover it up, pinning the lint in position. Put the arm in a sling, excuse the case all duties, and direct him to attend daily for the same treatment.

The lint should be large enough to enfold the arm loosely, the opposite (diagonal) corners to be fastened inside the arm with

a safety-pin. The upper corner to be similarly fastened to the inside of the shirt or vest, but near the shoulder. The lower corner lies loose.

This is not a lightning cure, but from the very first application all untoward symptoms are checked; the inflammation begins to subside and continues to do so.

Correction of Enteroptosis in Children.

KERLEY in the *Medical Record* of October 1, 1921, states that the symptom-complex enteroptosis in children is a habitually poor appetite, recurrent vomiting, nausea without vomiting, eructation of gas, and constipation. These children are improperly nourished because of insufficient food intake.

The habitually poor appetite is due to the presence of residue in the stomach when the next meal hour arrives. In order for a child to be hungry at meal-time there should be an interdigestive period of half an hour to an hour. In addition to the poor appetite the residue case is a subject of recurrent vomiting and has usually been treated for acidosis.

Ptosis of the colon and sigmoid invariably means constipation of a nature that requires daily attention to the bowel function. These patients are usually of the sway-back type and the abdomen is enlarged.

The first step is to secure proper mechanical support. An abdominal belt with a projecting ridge for those in whom the stomach alone is ptosed is fitted to the patient. The ridge is so arranged that the pressure is exerted against the lower portion of the stomach. In those in whom both the stomach and intestine are involved, a large thick pad is fashioned and attached to the inner surface of the belt. This support is worn constantly when awake.

The carrying requirements of the stomach are lessened and the emptying of the stomach is facilitated by having the child rest in a recumbent position (on the right side, if possible) for an hour after a meal, and only solids are given at meal-time. Fluids such as milk and water are given at a period equally distant between meals.

Pyloric spasm, which is frequently found in other abnormalities, has not been much in evidence in the ptosed stomach.

An anti-constipation diet schedule is given the patient. Laxative doses of aromatic cascara are given three times daily in sufficient quantities to produce an evacuation. In some cases he has added nux vomica and belladonna. Daily massage by a skilled operator is employed if the family means will permit. The results of this management in the main have been satisfactory.

The improved appetite is readily produced by establishing a normal emptying of the stomach, and a satisfactory gain in weight has followed the larger food intake.

The Tobacco Habit.

In an editorial on this subject the *Lancet* of November 19, 1921, states that in a lecture on November 9 inaugurating the winter session of the Pharmaceutical Society of Great Britain, Dixon dealt with the subject of "Drug Habits," beginning with the nearly universal habit of tobacco smoking. He gave a comparative analysis of the smoke from tobacco and opium burned under conditions similar to those which occur in smoking. The first column is the product of 100 g. of tobacco burned as cigarettes, the second of 100 g. of dross opium containing 7.35 per cent of morphine.

Percentage product.	Cigarette smoke.	Opium pipe.
HCN	0.080	0.010
Pyridine	0.146	0.147
Nicotine	1.165	....
NH_3	0.360	0.395
CO	410 c.cm.	0
Morphine	....	0.016*

*Chandoo opium smoke contains 0.1 per cent.

Dixon continued:

"Ordinary Virginia tobacco, from which cigarettes are made, contains, weight for weight, nearly twice as much nicotine as Manila cigar tobacco. But when these two are burnt during smoking, the smoke from the cigar contains more than twice the amount of nicotine than that from the

cigarette. During the slow combustion of a cigar, as in ordinary smoking, immediately behind the lit end is an area in which the water and other volatile substances in the tobacco condense; during the act of smoking a large portion of the nicotine at the seat of combustion is destroyed (50 per cent), and the nicotine which finds it way into the mouth of the smoker is derived from the hot gases passing through this hot moist area in which the rest of the nicotine has condensed. The smaller the moist area behind the point of combustion the less likely is the smoke to contain volatile toxic bodies. A thin cigar or a cigarette will yield fewer of these products than a thick cigar, for the thin cigar or cigarette obviously permits a relatively greater cooling.

"The nicotine from the smoke of one cigar should correspond with the nicotine from that of 12 to 18 cigarettes. In practice it seems as if even less nicotine than this reached the circulation unless the cigarette is smoked to the very end. Experiments made by Dixon some years ago on boys showed that the Manila cigar caused a considerable rise in blood-pressure in five or six minutes, followed by collapse, representing respectively the stimulation and depression of nicotine on nerve-cells. No such effect could be obtained with cigarettes. The blood of cigarette inhalers, however, contains carbonic oxide, perhaps 5 per cent for a man who smokes 20 cigarettes a day, and the vertigo, tremors, nausea, anemia, and loss of memory for recent events are all symptoms which occur in chronic CO poisoning. The cigar smoker, on the contrary, absorbs a considerable amount of nicotine, and true nicotine poisoning may follow from excess.

"Some tolerance can be acquired to both nicotine and CO. Nicotine tolerance is brought about by destruction of the alkaloid in the body of the addict; since the alkaloid reaches the circulation slowly and in minute quantities the tissues are able to deal with it. CO tolerance is known in animals, and is due to an increase in the number of red blood-cells and percentage of hemoglobin."

Dixon attributed the pleasure of smoking partly to the stimulating and later narcotic properties of nicotine, though there are other factors like rhythm and sight to consider.

The Mirage of Urinary Antisepsis.

In an editorial on this subject the *Medical Record* of November 26, 1921, says that from the days when Lister filled his operating-room with carbolic acid spray down through the long succeeding line of experiments with all varieties of antiseptics, physicians have had ever before them the ideal of perfect asepsis, or, failing that, of complete antisepsis. Enthusiastic physicians have seen just ahead of them the abolition of nearly all disease by the application or administration of appropriate germicides.

One of the primary obstacles in the road toward such a goal, however, was the fact that the usual antiseptics, in strength sufficient to be germicidal, were altogether too irritating to be applied to such areas as mucous membranes or the interior of viscera. In the face of this undoubted fact, compromises were made. Thus we had substances which would gradually liberate antiseptics which, mingling with the natural fluids of the part in question, would be mildly antiseptic. Of this nature were the various intestinal antiseptics which began to flood the market, lozenges which, dissolving slowly on the tongue, were presumed to inhibit the growth of oral bacteria, and so on.

The advent into therapy of hexamethylenamine was naturally the occasion for rejoicing among the devotees of this doctrine. Here was a substance which when taken internally resulted in formaldehyde being excreted in the urine, the bile, cerebrospinal fluid, middle ear, and possibly other places. This at once gave rise to many schemes of therapy, as, for example, the treatment of general paresis by sterilizing the spinal fluid. Many English psychiatrists seriously recommended the drug in this disease, published case reports showing apparent improvement in patients

treated with it, and even put the method into text-books.

The most obvious use for the new drug, however, was as a urinary antiseptic. But as the years go on it becomes increasingly evident that it must be relegated to a position but little, if any, higher than salol, boric acid, and ammonium benzoate. The mirage of a perfect urinary antisepsis still lures us on, but fades on our approach. Aside from the difficulties necessarily involved in finding a chemically stable substance which will pass through the kidneys in sufficient quantities, which will be non-toxic, and which will be sufficiently antiseptic in large quantities of urine of any reaction, we have the frequent presence of a chronic source of reinfection with which to contend. In the presence of such things as retention, a stone, or a neoplasm, such a drug as hexamethylenamine is by no means specific—in fact, we are coming more and more to believe that its chief value is as a prophylactic. The ideal urinary antiseptic is then still to seek, and we must regard it as one of those problems such as the search for a specific for tuberculosis and a treatment for paresis, which continue to fascinate investigators.

The White Lead Question.

In an editorial on this subject in the *Lancet* of November 19, 1921, it is stated that the appearance at the present moment of a book dealing with white lead is opportune, since the question is being keenly debated as to whether the use of this material in paints should be interdicted by civilized nations (see the *Lancet*, Nov. 12; a Report of the International Labor Conference at Geneva). The author, Cantineau, who is frankly and whole-heartedly a prohibitionist, presents his case as an advocate rather than as a judge; moreover, when dealing with the clinical aspect of the case, he suffers from not being a medical man. But we find here a useful summary based for the most part upon government inquiries and investigations carried out in many countries. All lead compounds, whether soluble or insoluble, are held to be poisonous; while, of them, white lead—*i. e.*, carbonate of lead—is considered to be the most poisonous, and to claim most of its victims from among painters. Indeed, the number of deaths due to lead poisoning among painters is found to exceed that occurring in all other industries put together; nor does the damage cease there, since lead absorption, even to a slight degree, predisposes the victim to other diseases. We regret to find the skin placed in the forefront as a portal of entry for lead, the digestive system placed second, with the inhalation of lead dust third, since Legge has incontestably demonstrated that the order should be exactly reversed. Similarly, the author is at fault in speaking not unfavorably of the so-called electrolytic treatment of plumbism, which appears to possess no value. Cantineau is at his best when pointing out the almost insurmountable difficulties attending efforts to protect painters while working, for example, in private houses, from risk of lead poisoning, so long as paints continue to contain lead.

The question as to whether illness among painters arises from breathing the vapor of turpentine and whether such illness may not have been ascribed to lead poisoning (an opinion recently put forward in this country by Goadby) is discussed by Cantineau at some length. Manufacturers of white lead, wishful to preserve their industry from destruction, have certainly attempted to make turpentine a scapegoat; the position is, however, difficult to accept when lead poisoning disappears, while paints containing no lead, but turpentine as before, are employed. The painter may be exposed to two risks; is that a reason for not abolishing one? If turpentine is toxic, we can turn our attention either to finding a substitute or to rendering it non-toxic.

The second part of the book is an excellent historical account of the fight to abolish lead poisoning among painters. France has led the way, for there the campaign started at the end of the eighteenth century, was active throughout the nineteenth, and

became acute at the commencement of the present century. It finally culminated in France in 1909 in a law prohibiting the use of white lead, linseed oil containing lead, or of any material containing white lead for painting the inside or outside of buildings. A period of five years was given before the law should become operative, and the war intervened. The law was not enforced, and even now that the war has been over three years, the difficulties of enforcing it have not been overcome. The difficulties arise from the fact that the manufacture of paint containing lead compounds is not abolished; such paints can still be used in the coach-building trade; meanwhile, inspectors cannot adequately control the use of such paints in private houses and other places. Clearly, if France intends to abolish the use of lead in paints employed on buildings, the law will have to be materially strengthened. No other country has yet proceeded so far. Regulations more or less stringent have been tried in Austria and in Germany, but they have failed to abolish the evil. The movement in Belgium, where regulations have also been tried, is discussed by Cantineau at some length, and the successful result of abolishing the use of lead paints on the state railways is quoted. The case with regard to Great Britain, where up to the present no action has been taken, is presented by relating the findings of the committees appointed to consider the matter; indeed, throughout this book the evidence presented, and the conclusions arrived at, by these important committees are frequently quoted at length.

The remedy recommended is considered in the last part of the book. Here the conclusions of the author, who is an engineer, are of particular value. He maintains that substitutes such as zinc white and lithopone have been proved the equal, if not superiors, of white lead; and that supposed difficulties in their use are entirely imaginary. He shows, by quoting market prices, that both these materials to-day cost less than white lead. The sources of supply are looked into and declared to be adequate, so that increased demand should not inflate prices, but rather, by calling more manufacturers into the field, tend to lower them. "If to-day white lead were suppressed," he asserts that "our houses would be painted as well as they are now and that we should not suffer in any way; and that very probably, after a period of twenty years, we should almost have forgotten the very existence of white lead."

Nightshade.

In an editorial on this subject in the *Lancet* of November 19, 1921, it is stated that the series of cases of belladonna poisoning, notes of which have been appearing in its correspondence columns, brings before us two striking points in the toxic action of this drug. First, the capricious way in which it selects its victim; and, secondly, the way it spares its victim when it has brought him to death's door. Many of us have had experience at any rate of minor cases of poisoning, such as that of a patient who, after the application of a belladonna plaster or of the liniment, has a wide-spread erythematous rash, or loses the power of accommodation so completely that he or she—it is generally, of course, a female patient—avers blindness. Firth and Bentley, in the case related in the *Lancet* of October 29, 1921, gave a more unusual method of absorption, a method which may well have been the cause of some of the unclassified cases of rabbit poisoning in the past. Atropine is rapidly absorbed and rapidly secreted, mainly by the urine, so that in this case the rabbit had probably taken the herb recently. On the other hand, patients delirious from atropine, and even those who have reached the stage of the somnolence which follows delirium, frequently recover. The poison works itself off in sleep, and the patient who has seemed in danger wakes as from a dream. While the opium case frequently does badly, the patient who seems to have a corresponding depth of poisoning from belladonna does

better than the medical attendant might expect. Of course, there are a certain number of deaths. In the Registrar-General's causes of death in England and Wales for the nine years 1911-19, 102 deaths are recorded (accidental and suicidal) in which belladonna and hyoscyamus apparently played some part.

Of recent years pharmacology has cleared up the active principles of the belladonna series, so that now we have little to consider but the isomers atropine and hyoscyamine, and the closely allied hyoscine or scopolamine. The first two stimulate the brain centers and paralyze nerve terminals, the last depresses both centers and terminals. The various species of datura are now recognized to owe their active properties to these alkaloids. Poisoning by any species of datura must be very rare in Britain, but Ishmael states, in the *Practitioner* for July, 1915, that in Cairo datura poisoning is so common that it occurs in frequency next only to acute alcoholism, and the symptoms are those of belladonna poisoning as regards the dilated pupil, the joking delirium, and the rapid recovery. He further writes: "I have not seen a fatal case, though many on admission were and remained for some hours on the verge of death."

Addiction to Drugs.

In an editorial on this subject the *British Medical Journal* of November 19, 1921, states that nowadays so much is heard of the evil effects of the drug habit or addiction to drugs in other countries that Dixon's address on the subject, printed in the same issue, will be read with great interest. Without attempting any definition of the term "drug," he points out that human beings have always had the taste for drugs, whether stimulants, sedatives, or what not, and that to set all these substances down as purely harmful is no doubt to do an injustice to the unconscious physiological acumen of our ancestors and ourselves. Tea, coffee, tobacco, and alcohol are all of them drugs, and Professor Dixon enumerates some of the harmful effects they may work in the human organism; but, except in the case of alcohol, he excludes them from the list of true addiction drugs, of which, of course, morphine is the stock example. Striking a balance between their good effects and their injurious influences, he is clearly in favor of their use with temperance, though temperance is not the word he uses. All men are not made alike; to the poet tea may appear as "the cup that cheers but not inebriates," while in the charwoman it may produce such symptoms as the tremulousness, the fits of excitement and depression, and the anemia with which so many medical men are familiar. In the case of alcohol Dixon emphasizes the crop of new and more harmful drug addictions which seem apt to spring up in countries that try to enforce total abstinence by law. The chronic drunkard starts life handicapped by some imperfect development of his brain; nobody questions the evils produced by alcohol in the intemperate, but for the vast majority of civilized persons moderation in alcoholic beverages produces pleasure and, by so much, benefit; and it is argued that legislation is happiest when it works for the vast majority of those whom it is calculated to affect.

Turning to the true addiction drugs, opium with its derivatives and congeners of all sorts, Dixon finds nothing good to say for their use in unqualified hands. He remarks that their devotees are the highly strung, oversensitive, and nervous persons of their day, quick in perception, acute in sensibility, lacking in balance and in backbone, eager to escape from the realities of life. In narcotism, he says, they shut out contact with reality, and drift along knowing little of the reactions of mastery and defeat; they are shattered by the inhibition of their higher centers, and the very acuteness of their intellect is their undoing. Remembering DeQuincey and possibly Coleridge, it may, perhaps, be necessary to admit that in a very few special instances persons possessed of such vivid sensations might benefit by a narcotic; but as a rule the morphinist, though not a mental defec-

tive, must be regarded as a menace to society—casual, careless, untrustworthy. It is argued by some that normal persons never become drug habitués, and that addiction to drugs may be taken as evidence of an existing psychopathy.

A Confection for Constipation.

LYON, in the *International Journal of Gastro-Enterology*, states that a very useful preparation to aid in weaning the patient from his pills, salts and enemata is the following fruit paste: One-half pound of figs, one-half pound of dates, and six stewed prunes with the juice; run through a meat grinder, with a half-ounce of pulverized senna mixed in, and one ounce or more of granular agar-agar. The whole is made into a firm mass, and kept cool. A small olive-sized piece is eaten with each meal, and gradually reduced to a smaller and smaller piece on retiring.

The Prevention and Treatment of Bed-sores.

RIDDOCH, in the *British Medical Journal* of November 19, 1921, considers that one of the most grave complications which may follow gross lesions of the spinal cord and cauda equina is the formation of bed-sores and the toxemia which results from them. Several factors probably play a part in diminishing the vitality of the skin, and of these not the least important in the early stage of acute paraplegia is defective circulation in the paralyzed portion of the body. Thus for the first two or three weeks after acute lesions of the cord, when reflex activity is depressed and the paralyzed muscles are atonic, edema tends to develop in dependent parts, the skin rapidly becomes discolored if subjected to pressure, and venous thrombosis is not uncommon. Sluggish circulation is partly the result of impaired local vascular tonus, due to disturbed innervation, and partly the result of lack of that support to the vessels which is normally afforded by muscles in a state of contraction. Later, as tone in the muscles and reflex movements appear, the circulation in the lower limbs and the nutrition of the paralyzed tissues improve; bed-sores are then more easily combated. Bed-sores are always more liable to develop in the presence of debilitating and febrile complications and when the skin is analgesic, for then abrasions and wounds fail to attract the patient's attention.

The prevention of bed-sores is the nurse's province, but it is the duty of the physician to see that she knows how to carry out her work efficiently. In order that pressure on the paralyzed parts is distributed equally the patient must be nursed on a water or air bed. Further, his position in bed must be altered several times a day, care being taken when he is placed on his side that one lower limb does not rest on the other. An overhanging rope or chain slung from a vertical support attached to the top of the bed is a necessary part of the nursing equipment. By pulling on it and raising himself in this way the patient can help the nurse to move his body, and in addition the exercise entailed is beneficial.

Sufficient time is not always expended in washing the skin, which should be well lathered with soap and water morning and evening. But removal of the dirt is not in itself sufficient. An indispensable part of the process is firm and prolonged friction with the palm of the hand to increase the vascularity of the skin. In giving instructions to the nurse this point ought to be insisted upon, and she should be told to pay particular attention to bony prominences. The whole operation is completed by dusting the skin with a bland powder.

Another of the nurse's duties for the prevention of bed-sores is to see that the sheets are kept dry. The common causes of wet beds, spilling of urine, the involuntary evacuation of loose motions, and profuse sweating, are most troublesome in cases in which the lower limbs are the seat of spasmodic reflex movements. These when violent and flexor in form may excite

reflex micturition, defecation, and sweating, upset the urinal, and drag the unfortunate patient to and fro on the bed. Their control is mainly a question of prevention by removing the stimuli which cause them. Thus the bedclothes over the feet must be held up by a cage; undue tension on the flexor muscles should be prevented by placing a small pillow under the knees and supporting the feet with an adjustable footrest, and pressure of the urinal on the external genitals ought to be diminished as far as possible by suitable means.

In the event of bed-sores developing, their treatment must be persistent if septic absorption is to be minimized and healing promoted. Wounds of this kind are often regarded as hopeless, and the treatment adopted is in consequence half-hearted. But although paralyzed and insensitive tissues react feebly to infection, they will heal in the majority of cases if they are assiduously treated by appropriate methods.

Care must be taken that the blood-flow to and from the wound is not impeded by pressure on the surrounding tissues. This can be achieved by adjustment of the patient's position in bed and avoiding the use of rubber air-rings. For superficial clean sores stimulating dressings ought to be chosen, and dry gauze or gauze soaked in liquor aluminii acetatis 2 per cent, red lotion or a 2-per-cent aqueous solution of silver nitrate will meet this purpose. Bleeding from the surface of the wound, however, is an indication for the use of emollients such as equal parts of castor oil and zinc ointment or glycerin and compound tincture of benzoin. In the case of deep sloughing sores the dead tissue must be removed and the wounds thoroughly explored for hidden collections of pus. Excellent cleansing solutions for these wounds are eusol 1 in 4000, liquor sodæ chlorinatæ (B. P.), and liquor aluminii acetatis 2 per cent. Fomentations are of value, but they must be frequently changed and used for not longer than a day at a time, as they are likely to lead to the formation of pale, unhealthy granulations. A good general rule in the treatment of bed-sores is to often vary the form of dressing and antiseptic fluid employed.

When a dirty sore situated over the trochanter of the femur or the ischial tuberosity has penetrated and infected the underlying bursa the sac must be excised, otherwise healing will not take place. Black blisters on the heels do best if the skin forming their outer walls is left as a covering for the wounds. They should be protected with clean dressings after the fluid has been removed through a small incision.

Wood Tar Oils for the Destruction of Lice on Hair-clad Areas.

Bacot, in the *British Medical Journal* of November 19, 1921, states his conclusions in respect of the use of such wood oils for the destruction of vermin in hair are as follows:

Nymphs should always be used in control tests, because, owing to the protection afforded by the double skin with which they are temporarily endowed when moulting, they are far more resistant than adult lice.

No absorbent material should come in contact with the treated area for a period (as long as possible up to an hour); greased or waxed paper or rubber-surfaced articles should for preference be used to cover the hair after treatment.

In treating hair-clad areas by spraying or other methods the oil must be used liberally so as to render the complete immersion of the vermin in droplets of the oil probable.

The oil should always be used neat, or if for any reason it is necessary to economize it, the fluid added should either be another oil or some fluid with which the oil is miscible. It must be borne in mind that volatile fluids, though frequently increasing penetration, shorten the period of action. Hence the effective nature of such remedies as olive oil and paraffin, where both the slow penetration of the heavy oil and the rapid evaporation of the light mineral oil are compensated for by mixing the two.

A repetition of treatment is always desirable within a few days. For typhus work

a second treatment is essential in case eggs may have escaped the first treatment, because such eggs may hatch while the patient is still infective, and the lice after feeding be transferred to a nurse or doctor.

The objectionable odor of paraffin can always be covered by the addition of a small quantity of an essential oil or other scent such as oil of mirbane (nitrobenzol), camphor, etc. Camphor has an additional advantage in that it has the property of allaying skin irritation.

Surgical and Genito-Urinary Therapeutics

Cautery Operation for Cancer of the Breast.

PERCY (*Surgery, Gynecology and Obstetrics,* October, 1921) adds in this paper six new additional factors in the technique of breast operations, which he believes will improve very materially the statistics of this procedure.

He gives his technique in some detail and pictures enormous incisions made by the electrocautery knife. He observes that an occasional hemostat may be required. There is no gauze dissection in any part of the field. If gauze sponges are required, and this is rather rare except to mop up the melted fat, they are allowed to touch the operated surface but once, when they are discarded. The operator's rubber-gloved hands are frequently dipped in a weak solution of iodine.

He states, first, that only the hot knife should be used in the removal of breast carcinoma, including a complete dissection of the axilla.

Second, that in the advanced type of case no attempt be made to preserve or secure skin flaps.

Third, that the skin around the denuded area (left without flaps when the breast and axillary glands are removed) be undermined from 2 to 4 inches with the hot knife.

Fourth, that in the after-treatment, besides the use of Dakin's solution, the arm on the operated side be maintained in an elevated position with the forearm resting on the top of the head, until practically the surface denuded by the hot knife is entirely covered with new skin.

Fifth, that vigorous, daily massage and forcible movement of the skin and arm adjacent to the denuded area be instituted as soon as granulations have commenced to appear.

Sixth, that the only carcinoma of the breast considered inoperable by the heat technique is the one in which inaccessible metastasis has developed.

The unheated knife does not devitalize any of the malignancy it does not remove; the hot knife does. The cold knife does not spoil the soil for the further development of cancer; the hot knife does. The knife unfortified with heat, if it touches cancer, vaccinates it into new areas; the hot knife does not. The cold knife stimulates the growth of the unremoved cancer cells; with the hot knife this is impossible.

If the arm on the operated side is kept closely approximated to the side of the head and the forearm turned over the top of the head and fastened there, the patient will obtain the maximum of comfort.

To maintain this position of the arm Percy has found nothing so satisfactory or efficient as the simple placing of a clove hitch around the wrist and tying the other end of the bandage about the opposite shoulder.

It is more comfortable than when the forearm is placed upon the chest, and the arm rigidly bound to the side of the thorax.

Most important, it requires the natural reparative powers of the body to supply a sufficient amount of new skin to permit of the final maximum normal movements of the arm. It is comparatively easy to get the

arm down after being in this position, if necessary, for weeks or months; but it is almost impossible to get it up if the healing process has occurred while the arm is down.

The chances for the development of a lymphangitis and edema from cicatricial occlusion of the axillary vessels are greatly lessened. In fact, the author has had no presentment of this condition in any case in which this position has been strictly maintained until the wound has been completely covered with new skin.

The fourth requirement in the after-treatment, following the extensive removal of supposedly infected cancer-involved tissues, concerns the employment of active and vigorous movement of the edges of the wound circumference. This, however, will accomplish nothing until the bare space has begun to fill in with the resulting hyperplastic granular mass which nature finally puts in the place of the removed structures. When this is properly manipulated, *i.e.* massaged, a new skin, which is a remarkably good substitute for the original, develops. This usually requires ten days to two weeks before a good start is made. In the meantime the wound is kept sweet with the Carrel-Dakin or eusol solution. When the new tissue begins to appear the adjacent skin should be pushed toward the operated space, firmly and persistently, at least once each day. Failure to do this permits of the development of pale, grayish-looking, easily bleeding, unhealthy granulations that will not cover with epithelium; but active, progressive, even forcible movement of the skin, as soon as the granulations are in evidence, encourages the development of a blood supply that initiates the development of a new epithelial covering in a most remarkable way. Curiously enough, the development of the new skin covering is not alone from the edge of the wound, but it springs up often, after two or three weeks of this persistent manual movement of the skin edges, all over the operated field. At first it looks as if small, isolated patches of frost were appearing—with the difference that they are less white than frost.

The phenomena here described of the development of this skin covering, following this method of management, is so remarkable as almost, if not quite, to establish a new principle in the surgical healing of large wound surfaces. The skin that results from this procedure or treatment is more normal in appearance and, therefore, much more efficient than any that can be obtained by the so-called Thiersch grafts. The latter, when planted on these large areas of denuded surface, remain firmly attached to the underlying surfaces, and as such easily and frequently break down because too fragile to serve well as a normal skin covering. At each daily dressing of the wound the whole area is actively moved and the arm massaged from the tips of the fingers to the shoulder. There is a remarkable absence of pain or temperature following this operation, either in the region involved in the treatment by the cautery knife or when the arm is moved at the wrist, elbow, or shoulder. The administration of even a small dose of morphine is almost never required.

The Disastrous Results of Certain Abduction Fractures of the Ankle-joint.

LANE *(Lancet,* Oct. 1, 1921), incident to a sequence of consultations upon the unfortunate results of treatment of fracture of the ankle-joint, described for the first time by him many years ago, has felt impelled to write as follows:

If the foot is adducted with a force greater than the skeleton is able to bear two varieties of fracture may result:

The direct impact of the facet on the inner aspect of the astragalus upon the internal malleolus results in a more or less vertical fracture of the tibia, the line of fracture passing upward in such a direction as to carry away the internal malleolus and a triangular area of the shaft of the tibia. As this fragment is displaced upward the gap between the malleoli is widened and the grip of the tibia and fibula upon the astragalus is rendered less secure than it was.

If forcible abduction be continued after

the internal malleolus has been broken down, strain is exerted through the external lateral ligament on the outer malleolus sufficient to break the fibula transversely over the lower end of the tibia. The fibular fracture is usually somewhat crunched.

It is obvious that should any difficulty be experienced in placing the fragments in either of these fractures in accurate apposition, the best possible result can be obtained by securing the internal malleolus in position by means of a plate and three screws, an operation which makes little demand on the skill of the surgeon. At the worst, except in a few cases, neither of these fractures is followed by serious disability.

If the foot is abducted with a force greater than the skeleton can bear, fractures of three degrees of severity may ensue.

In this movement the areas of the articular surface of the ankle-joint which sustain the greatest pressure are the anterior portions of the facet on the external malleolus and on the astragalus. In consequence of this pressure on the front of the malleolus a torsion fracture of the fibula results. The situation of this fracture may vary within wide limits; it is never transverse, as originally described and illustrated diagrammatically in the text-books, but is very oblique, or in some cases nearly vertical. If the fracture extends through the malleolus there may be no displacement of fragments, and the injury may only be seen in a radiogram taken from side to side. In no case of suspected abduction fracture should the surgeon be satisfied to express an opinion solely from the examination of a radiograph taken from before backward. If the fracture be through the shaft of the fibula above its articulation with the tibia the displacement may be very considerable and correspondingly difficult to replace.

If the foot is displaced still further outward strain is exerted through the internal lateral ligament upon the internal malleolus, which may be broken transversely. Occasionally the ligament may be ruptured instead.

These two fractures are met with fairly frequently. In many instances the displacement is trivial, and in most a moderately good result may be obtained by splinting, controlled by radiography. When the surgeon is unable to bring the fragments into reasonable apposition and to retain them—especially in patients in whom a joint affording a normal security is of great importance—the exposure of the fibular fracture, the accurate restoration by means of traction and forceps of this bone to its normal form, and its retention by means of a plate and four screws give a perfect result. The internal malleolus falls automatically into position and does not require to be fixed by a plate. The exception to operative measures is when the patient is old or alcoholic and the bone is very fragile or severely comminuted. The difficulty that this particular fracture presents is that the lower fibular fragment consists of a long sharp spike, extending upward and backward, which has to be fitted and secured to the end of the shaft of the fibula.

If the foot is abducted with still greater force the pressure exerted on the lower fragment of the fibula may by its strain upon the interosseous ligament tear off a wedge-shaped area of the lower end of the tibia of variable size having its base downward. This fragment includes a varying proportion of the articular facet on the tibia. The ends of the shafts of the tibia and fibula are displaced forward, the former resting upon the neck of the astragalus and upon the anterior portion of its tibial facet, while the lower fragments of the tibia and fibula are carried back with the displaced foot, both fragments forming a large open angle with their corresponding shafts.

This last is the fracture to which the author wishes to call particular attention. His experience of the treatment of this fracture, of which very many cases have passed through his hands since he first recognized it early in his career, is that it is very often impossible to replace and retain the fragments in accurate apposition by means of manipulation and splinting alone. That this is certainly the experience of others is fair to assume from the conditions presented by those cases which have come

under his observation some months after treatment. As far as he could gather from the history of these patients, they were regarded as ordinary examples of so-called "setting" which entailed the administration of an anesthetic. The limb was then put up in a splint and a perfect result was promised. Some were radiographed subsequently, but no mention was made to the patient of any residual displacement, if it was observed, and certainly no effort was made to rectify it.

It is unfortunate that once the fragments of the tibia and fibula have united in their displaced position the possibility of separating the tibial fragment and of restoring it to its normal position is very small. This is due to the fact that the end of the tibia has formed for itself a new joint with the upper surface of the neck of the astragalus and the adjacent portion of the tibial facet on the astragalus, while the fibular and tibial fragments, having united with the shafts, articulate with the rest of the facet on the astragalus—which has become much altered in form—with the process of bone behind it.

In the other varieties of adduction and abduction fractures it is usually possible by operation to replace the inner malleolar and fibular fragments in their normal position and to restore the function of the joint. In this particular fracture the presence of the displaced tibial fragment forms what is practically an insuperable obstacle.

Surgeons have no valid excuse for the very disastrous results that follow these methods of treatment, since it is possible to obtain excellent radiograms in most places in the country. What has puzzled the author is that none of these unfortunate patients had resorted to the law courts, although the failure of the surgeon to perform his duty is only too obvious to the meanest intelligence, in view of the facility with which radiograms can be obtained by patients in the present day.

Apart from cases in which the bones are fragile and comminuted from advanced age or prolonged alcoholic excess, this fracture can be dealt with successfully by operation. A vertical incision exposing the fibular fracture enables the surgeon by suitable manipulation to restore the fragments of the fibula to their normal relationship. The accurate adaptation of the fibular fragments entails that of the tibial fragment, since the fibular fragments cannot be approximated unless the tibial section fits into the gap in the tibia. The fragment of the internal malleolus also falls automatically in position and remains so. The fibular fragments can then be secured accurately in position by means of a plate and four screws, supplemented in a few instances by the use of an encircling loop of steel wire.

Much of the difficulty and failure which the surgeon experiences in the treatment of fractures is due to the fact that while in his preliminary studies he is called upon to acquire a transitory knowledge of much that is relativly useless to him in the efficient performance of his profession, the fundamental principles of mechanics upon which a knowledge of the function of the skeleton and soft parts and of the treatment of the variations they undergo from injury or disease is absolutely essential are excluded from his education. The fault lies not with the surgeon, but with the teacher.

Methods of Performing Cæsarean Section.

HOLLAND (*British Medical Journal*, Oct. 1, 1921) observes the operation of Cæsarean section has been standardized for the past forty years. The classical operation has well stood the test of time. It is remarkably simple, and its mortality has been reduced to such an extent that it has become a very safe procedure. The safer an operation is the oftener is it performed and the greater is its list of indications. From 1882 the estimated mortality before the uterine suture was 50 per cent. With this huge mortality the indications for this operation were correspondingly small. Indeed there was but a single indication, *i.e.*, when delivery by the natural passages was impossible. In 1910 the mortality was reduced to less

than 20 per cent. Of 4000 recent Cæsarean sections performed for various indications the total number in which the operation was performed for pelvic contraction was 3374; of 1202 cases operated on not in labor, the mortality was 1.6 per cent; of 389 cases operated on early in labor the mortality was 1.8 per cent; of 224 cases operated on late in labor the mortality is 10.7 per cent; of 35 cases operated on after the induction of labor the mortality is 14 per cent; 103 cases operated on after futile attempts at forceps delivery, the mortality is 27 per cent.

The defects of the classical operation met with in practice are as follows:

The risk of sepsis in infected or suspected cases. The classical operation is not safe in cases in which infection is suspected or present—that is, where labor is advanced and the membranes are ruptured, and where there have been many vaginal examinations or perhaps attempts to deliver by forceps.

The risks of rupture of the scar in subsequent pregnancy or labor. Quite apart from rupture of the scar, which is comparatively rare, the proportion of thin and defective scars which is found at subsequent operations is very high. The author found that the frequency of rupture in subsequent pregnancy or labor was 4 per cent, and that the proportion of ruptured scars to successful deliveries by the natural passages, in the series of cases he investigated, was 1 to 4.

The risk, a rare one he admits, of intestinal complications during convalescence, an example of which was the case of intestinal obstruction due to the adhesion of intestine to the uterine scar, reported by Clifford White at the recent congress at Birmingham.

Adhesions between the uterine scar and intestine, omentum, or abdominal wall; these make sometimes a formidable difficulty, causing obstruction symptoms.

So long as the thick edges of the uterine incision are brought completely into apposition, and are kept in apposition during healing throughout their whole extent, it does not matter much what method is employed. The best method is, in the writer's opinion, the usual one of passing interrupted sutures through the whole thickness of the uterine wall, except the decidua. An essential point is that the sutures should start well outside the edges of the incision, so as to include a good thickness of uterine wall. If the sutures are passed too closely outside the edges, when they are tied the edges tend to buckle and the line of the sutured wound is thinner than the natural thickness of the uterine wall. For this reason a well-curved needle is best, and the path of the needle should take such a direction as to include a wide bite of muscle. Any method of single interrupted suture which fails to take a wide bite is not good.

It is of great importance to close the uterine peritoneum as a means of preventing leakage of sepsis from the interior of the uterus to the peritoneal cavity. If the usual method of interrupted through-and-through sutures which start wide of the peritoneal edge is employed, the covering of this layer by a superimposed Lembert peritoneal layer is often difficult to make perfect, especially if the uterus is contracting strongly and is well retracted.

To overcome this difficulty Holland first incises the peritoneum only throughout the entire length of the whole incision. He then reflects the peritoneum for half an inch all around, which is done easily. The muscle is then incised throughout the length of the bared area. In suturing the wound the muscular wall is sutured first; the reflection of the peritoneum allows of the needle being inserted well outside the edge of the muscle, so as to take a wide bite. After this layer is tied the reflected peritoneal edges can be accurately united, first by a running suture, and over that by a Lembert suture.

Another point of importance is to wait for complete retraction before inserting the sutures; if the wound is sutured before retraction is complete and the muscular walls are thin, the result is bound to be a scar thinner than the rest of the uterine wall. Silkworm-gut is the best suture material, silk the next best, and catgut most unsuitable.

In spite of the great merits of the classical operation, many surgeons are not entirely satisfied with it, and have devised other methods of abdominal delivery. These new operations can all be grouped together under the designation of "cervical" or "lower segment" Cæsarean section. As long ago as the beginning of last century an operation was devised for opening the lower uterine segment extraperitoneally through an incision above Poupart's ligament; it was revived by the American surgeon Gaillard Thomas in 1870 under the name of gastro-elytrotomy, as an alternative to the ordinary route, in order to avoid the dangers of septic peritonitis. But the operative mortality was as high or higher, and it quickly dropped out when antiseptics and Sänger's method of suture came in and brought such good results.

But the lower segment operation with a greatly improved technique has lately been revived, and its chief exponent in England is Munro Kerr.

The patient is placed in the Trendelenburg position, and the abdomen is opened from the symphysis to near the umbilicus. The uterovesical peritoneum is picked up and incised, and the bladder is dissected off the uterine wall, exposing the lower uterine segment. This reflection of the bladder is extremely easy, more especially in cases where the patient has been for some time in labor, and the bladder has followed the retracting uterus upwards; there should be no hemorrhage unless the bladder is dissected down too low. The lower uterine segment is then incised. The fetus and placenta are extracted and the uterine incision sutured; the muscle may be united either by a continuous or by an interrupted layer; over this another layer is used to close over the thick uterovesical cellular tissue or fascia. The edges of the divided uterovesical peritoneum are then united with a carefully placed continuous peritoneal layer.

The advantages are the wound lies in a quiet part of the uterus, and is at rest during healing. There is no tendency for the edges of the wound to be drawn apart, or for gaps to be formed between the sutures. For these reasons healing occurs under more favorable circumstances than in the classical operation.

The uterine incision is made through a less vascular area, and bleeding from the edges is extremely slight.

The edges of the wound are thin; suture is therefore easier and quicker.

The position of the wound is such that adhesions to the intestines, omentum, or abdominal wall cannot occur; there is only a short line of peritoneal sutures at the bottom of the uterovesical pouch.

The uterine wound is covered with a thick layer of fascia and by the bladder, and perfect closure of the peritoneum can be made. For these reasons there is less likelihood of infection of the peritoneal cavity; for it is generally conceded that the source of peritoneal infection is not so much due to contamination by liquor amnii or other uterine contents during the operation as to the subsequent passage of infection from the uterine cavity between the edges of the incision. Should peritoneal infection occur, the lower abdomen is more resistant than the upper.

The operation causes less disturbance of the abdominal contents; the intestines are never seen.

The scar is in a safer area for subsequent pregnancy and labor, for the lower uterine segment stretches late in labor. The stretching to which the scar is subjected is purely passive, for there is no powerful active drag upon each side of the scar, as there is in the scar of the classical operation.

As regards the performance of the operation, it is just as easy to a practiced surgeon as the classical; true, there is more "operating" in it—it is not done, as it were, by two strokes of the knife, as is the classical. The more advanced the patient is in labor, the easier will the operation be and the lower will the incision lie in the lower segment and cervix; in fact, in cases of excessive retraction of the uterus, the incision will lie partly in the upper end of the vagina.

So far only one case of ruptured scar has

been reported, and this is not a fair case, as the upper end of the incision had to be extended upward on the body of the uterus. At the same time it must be remembered that very few lower segment operations have been done compared to the many thousand by the classical method.

New Views on the Treatment of Tuberculosis.

Under this caption there is a leading article in the *International Journal of Surgery* which thus discusses the question:

Both the lepra and the tubercle bacillus belong to the group of acid-fast organisms and have similar morphological features, and it is therefore reasonable to assume that they may be attacked by the same class of remedies. From the ingenious experimental work of Walker and Sweeny it appears that the unsaturated fatty acids of chaulmoogra oil have a specific germicidal action upon acid-fast bacteria, being one hundred times more powerful than phenol. This explains their beneficial and even curative influence in leprosy, and awakens the hope that they will prove effective in tuberculous affections.

If the bacteriological evidence is confirmed by accurate clinical observations on a sufficiently large scale, a decided advance will have been made in the arrest of "the white plague." Particularly good results are to be expected where the tuberculous process is strictly localized, as in the surgical types of tuberculosis. Thus far only two of the peculiar group of fatty acids present in chaulmoogra oil have been isolated, namely, chaulmoogric and hydnocarpic. Experiments by Dean, McDonald, Wrenshall and others go to demonstrate that the oil contains even more potent acid materials, and chemists are now engaged in the laboratories of the United States Public Health Service and elsewhere in an attempt to isolate these. It may also be possible to construct these acids, which are found not only in chaulmoogra oil, but also in cod-liver oil, synthetically, and to modify and improve them with a view of increasing their therapeutic efficiency. Chaulmoogra oil itself is so repugnant to the taste and so disturbing to the gastrointestinal tract that its internal administration has been very unsatisfactory, while its irritating character renders it unsuitable for subcutaneous injection. The use of the ethyl esters of the mixed fatty acids, however, is unattended by these disadvantages, and when given by intramuscular injections, according to the method of Dean and McDonald, the results in cases of leprosy have been much better than those previously obtained.

Some favorable experiences have also been reported from the use of the salts of the fatty acids of chaulmoogra oil, the so-called gynocardates, especially by Rogers. It is of significance to note that the same types of unsaturated fatty acids are found in cod-liver oil, although they seem to be devoid of the specific germicidal power of the chaulmoogra acids upon acid-fast organism, and to effect their destruction in a different manner.

Observations in leprosy have shown that the ethyl esters of chaulmoogra oil must be administered for periods of a year or more before a cure can be effected, and this applies with equal force to a disease of such chronic character as pulmonary tuberculosis.

A Case of Ulcerative Colitis Successfully Treated by Colonic Irrigations from Above.

EINHORN (*Medical Record,* Oct. 15, 1921) records a case of a man twenty years old, who, in September, 1909, noticed bright-red blood in his stools. This condition continued with exacerbations and remissions until August, 1920, when he presented anorexia, diarrhea, asthenia, and considerable loss of weight. He had from one to thirteen bowel movements daily, often with bright-red blood. He had lost 16 pounds in weight from date of onset of disease.

Rectal injections of gelatin were given from December 8 to 15 inclusive. Tannin-agar was given, 1 drachm three times a day. Proctoscopic examination revealed inflamed

ulcerative areas extending down to within 4½ inches of the anus. On December 13 the first section of the intestinal tube was given; on the 14th the second part was attached; on the 15th the third part was attached; and on the 17th the fourth part was attached.

Calcium carbonate 0.5 gm. to 1000 cc of water per drip through the tube twice a day was started on December 14. On the following day the *x*-ray showed the tip of the tube in the coils of the small intestine. On December 16 the *x*-ray showed the capsule of the tube in the ileum. December 19 the *x*-ray showed the tip of the tube well within the coils of the small bowel. December 24 the tip was in the same place, the ileocecal junction. From this date calcium carbonate 1.0 gm. to 1500 cc of water twice a day through a tube and ichthyol 15 drops in the latter part of the drip. From December to January inclusive two ounces of a 1-per-cent solution of mercurochrome was injected into the tube slowly. Calcium carbonate solution was used morning and night. On January 1, 1921, one section of the tube was removed, and on January 3 the whole tube was removed through the mouth.

During the last week of treatment the stools were formed, the patient having not more than three evacuations and usually but one daily. Blood was present in ever decreasing amounts. His weight was 130 pounds on January 3; since leaving the hospital he gained 23 pounds.

As in a previous case reported by the author, instead of operating the jointed intestinal tube was used, in order to accomplish the same result, namely, irrigation of the large bowel with various medicaments from above.

This, indeed, accomplished a cure. As detailed above, mercurochrome, 60 cc of a 1-per-cent solution, was instilled daily through the tube as soon as the latter had reached the cecum; while a solution of calcium carbonate (0.5:1000) was instilled twice daily in quantities of a quart or a quart and a half at a time as soon as the tube had reached the small intestine. This was continued all the time until the tube was withdrawn. The patient was nourished in the usual way by the mouth. The diet did not deviate from the usual antidiarrheic régime.

Encountering quite some resistance in pulling the tube up, it was considered wise to accomplish it not all at once, but in two sittings. Accordingly but one distal joint was pulled up, and unscrewed, while the remaining joints were left in the intestine for another day. Then the other three intestinal tube joints were withdrawn gently in a few minutes, not causing any pain or discomfort.

The two cases reported show the value of the intestinal tube as a therapeutic agent. They also clearly demonstrate that the removal of the tube can be accomplished without difficulty either by letting it pass through the rectum or by withdrawal through the mouth. It is, of course, understood that whenever there is suspicion of some obstruction within the intestine the tube will have to be pulled up through the mouth. In this instance, especially when there is much resistance encountered when withdrawing the tube, it is best to perform this act in two sittings, first disengaging one joint, leaving the other tube joints in the alimentary tract for another day, when the rest is removed. The procedure is in this way made more comfortable for the patient.

Acute Abdominal Conditions in Gynecology.

CRILE (*New York State Journal of Medicine*, October, 1921) observes that the acute emergencies which the gynecologist may meet, however he may desire to limit his practice, or the acute pelvic conditions which the general surgeon may encounter when he opens the abdomen, differ little if at all in their essential treatment from any acute abdominal condition.

The acute peritonitis which follows an overflow of pus from a pyosalpinx is identical with the acute peritonitis which follows the extension of infection from a ruptured appendix, or gall-bladder. The collapse which results from a ruptured tubal

pregnancy differs not materially from that which follows perforation of the stomach or intestines, and the essential features of the treatment are the same.

It should be noted, however, that a primary pelvic peritonitis *per se* does not present the same problem as abdominal peritonitis, since the former tends to remain localized on account of its location and also because it is most frequently due to gonococcus infection. On the other hand, in an abdominal infection the pus tends to gravitate toward the pelvis, which thus may become involved in a peritonitis which originated in the gall-bladder, appendix, or elsewhere.

It has been said that "the pelvic cavity is the pathological cesspool of the abdomen," and the presence of a pelvic infection may be the outpost of a primary focus in the abdomen.

A discussion, therefore, of acute abdominal emergencies in gynecology becomes properly a discussion of the treatment of acute peritonitis, whatever its focus; of collapse from hemorrhage whatever its origin; of exhaustion from advanced disease, as from carcinoma, whatever the organ involved.

Since pus gravitates toward the pelvis and the peritoneum lining the pelvic cavity absorbs less rapidly than that lining the upper portion of the abdominal cavity, Fowler's position should be maintained throughout, before operation, on the way to the operating-room, in the operating-room, and after operation. Drainage should be established at the lowest point. If the focus of infection is within the pelvis, vaginal drainage is preferred. The establishment of drainage alone may be done first, leaving the removal of the organ—ovaries, appendix, gall-bladder, etc.—until the immediate danger is past and restoration has progressed to a point to make safe the larger operation. The operation should be under nitrous-oxide-oxygen analgesia, not anesthesia, never ether. Vast hot packs covering the entire abdomen and extending well down over the sides speed the processes of repair and aid the liver in its prime function of neutralization of the acid by-products of the infection process. From 2000 to 4000 cc or even more of physiologic sodium chloride solution, given subcutaneously every twenty-four hours until the period of danger is past, supplies to the cells of the body their essential element and aids in the maintenance of their normal acid-alkali balance. If the case is grave, morphine given hypodermically until the respiratory rate is reduced to 10 to 14 per minute relieves the organism of every activation excepting that required to combat the infection.

Whatever the occasion for the loss of blood, whether a ruptured tubal pregnancy or a perforation of the stomach from ulcer, no better treatment can be offered than that upon which the experience with hemorrhage in the Great War set the final seal of approval—direct transfusion of blood, physiologic and mental rest, morphine with nitrous-oxide analgesia and local anesthesia, and the briefest possible deft feather-edge operation to check the point of bleeding; a divided operation if the condition demands it; and always water by mouth, by rectum, and especially by hypodermoclysis. The key to this situation is the maintenance of the normal amount of fluid in the cells, with sufficient elimination to assure the avoidance of any accumulation of acids. If the acid-alkali balance of the cells is assured the patient is safe.

In exhaustion from prolonged disease, although it may seem that such a condition is not properly classed among acute conditions, nevertheless the acute emergency will all too readily develop in the case of a patient exhausted by a protracted wasting disease such as advanced carcinoma for example, if the precautions are not taken in advance of the demand.

Exactly the same dicta apply here as after the condition of collapse is present: Transfusion, water, hygienic regimen, physiologic and mental rest, digitalis—if the heart muscle is failing, analgesia, minimum trauma, divided operation.

Two prime factors determine the result of operations on the stomach: The state of

partial starvation and the degree of debility produced by the toxins of cancer or by hemorrhage. That starvation and advanced cancer produce marked intracellular changes in the brain has been shown by researches, and it is common experience that these two conditions are extremely unfavorable for surgical operations.

The observation of the following cardinal points in gastric operations will reduce the mortality and provide the utmost protection to the patient.

The general condition of the patient is improved prior to operation by the administration of large quantities of sodium bicarbonate and glucose (5 per cent of each) by rectum; and, if pyloric obstruction is marked, by the subcutaneous injection of much water.

If there is marked anemia, give an adequate transfusion of blood.

If the risk is extremely grave, use nitrous-oxide-oxygen only to the extent of analgesia; depend mainly on local anesthesia. If the risk is fair, proceed as usual for abdominal operations.

Make an ample incision so that the operation may be taken to the stomach, and the stomach not brought out, unless it will come out easily without being pulled.

If there is a cancer-like mass, and the hazard is great, then at the first operation make only a gastroenterostomy; otherwise complete the operation in one séance.

In case of a two-stage operation the resection may be made after the nutritional balance is well established, usually in about a week.

In the second operation not only will the resection be made with little disturbance, but as a result of the preliminary gastroenterostomy there will be a strong mobilization of the elements that make up local immunity against infection in the operative field.

In the resection, if adhesions are found, divide them with a sharp knife. Make all dissections with a sharp knife.

Make a wide excision of the tumor.

Use round needles for suturing the stomach.

Avoid postoperative hemorrhage by using the cobbler stitch.

Tie the interrupted sutures lightly.

Should there be postoperative vomiting use the stomach-tube promptly.

Usually less postoperative disturbance is caused by the second and larger operation than by the first.

After the resection take especial precautions to keep the patient warm, and to keep up a good nutritional and water balance. The two-stage operation gives splendid opportunity for this because the physiologic adjustment resulting from the gastroenterostomy occurs before the resection is made.

Cases of acute cholecystitis usually can be carried over the critical stage into a chronic stage, but when operation becomes necessary, in threatening acute cases, the following plan is strikingly successful:

Under only nitrous-oxide-oxygen—never supplementary ether—and with local anesthesia, the abdominal wall is divided over the very middle of the most tender, the most rigid area—not where the gall-bladder anatomically ought to be, but where the center of infection is.

The peritoneum is opened most cautiously and an attempt made to divide it wholly and only within the area of adhesion. If adhesions extend down to the distended gall-bladder, they are separated with extreme caution until the gall-bladder is reached, so that an aspirating needle may be inserted; the adhesions are separated only sufficiently to meet the absolute requirements for the establishment of drainage. As soon as the gall-bladder is opened (we are now discussing a fulminant acute case) a tube is inserted and nothing more is done surgically. Around this tube a quantity of iodoform gauze is lightly packed, after which large pieces of gauze are inserted around all the sides of the short abdominal incision. No stitches are used provided the incision is short and the gauze packing adequate. As a result the infection collapses, and a rapid convalescence follows. After all the acute symptoms have subsided, the temperature has remained long normal, and the patient has been in good condition

for a sufficiently long period, then a cholecystectomy is performed.

Gangrene resulting from acute intestinal obstruction and the presence of cancer are the two conditions for the relief of which a resection of the intestines is most frequently indicated. Whatever the condition, the first step is an exploration for the purpose of planning the operation and developing the operative field.

First an ample abdominal incision is made under complete local blocking with novocaine, for whatever condition may be found the muscles of the abdominal wall will then be relaxed, the exploration will be facilitated, and the use of gauze pads will be reduced to a minimum.

The preliminary exploration will invariably cause a certain amount of trauma in the unblocked territory, especially in the presence of intestinal obstruction. In such a case enough ether should be added to the nitrous-oxide-oxygen to insure complete relaxation until the completion of the exploration and the development of the operative field. If the general condition is poor, then a two-stage operation may be required. Moynihan's plan of dividing the peritoneal attachment of the colon is most useful as this mobilizes the colon to a great degree and permits easy handling with minimum manipulation.

The following are especially important points to be observed in performing an anociated resection of the intestines: Use silk sutures; use round needles. If there is plenty of room, close the divided ends and make a lateral anastomosis. The second choice is end-to-side anastomosis. The last choice is end-to-end anastomosis. If anatomically feasible, protect the suture line with omentum.

In the first stage merely bring out the tumor, cut it away between the clamps, and establish a lateral anastomosis by inserting forceps in each end; complete the operation in a second stage after the physiologic balance has been established. Relief from obstruction is the first consideration. The newer methods of controlling infection will minimize that danger. In all cases of cancer of the rectum a two-stage operation is performed. In the first operation under anociation, the incision is so placed as to allow complete information regarding the local extent and also the dissemination of the cancer to other parts, especially to the liver. If the case is operable, a Littlewood artificial anus is made, and the operative field is surrounded with gauze lightly impregnated with iodoform. These procedures involve a light and a short operation. After the physiologic action of the artificial anus is established and the patient's condition is satisfactory, usually within four days, then the excision of the cancer is made. Since the first operation, usually under analgesia, has caused but little disturbance, the patient looks forward to the second with relative equanimity.

The surgeon, too, may anticipate the second stage with equanimity, because of the many safeguards he is able to offer, principal among which are the following:

The iodine gauze, which mobilizes a strong defense against infection. The improved methods of combating infection and promoting the healing of wounds which have evolved in war surgery. The control of shock. The established, functioning anus, by which the new wound is completely protected from feces. The continued, unhampered nutrition. The resort to blood transfusion if anemia, or exhaustion, or hemorrhage wears down too much the resistance of the patient.

The promotion of the welfare of these cases of tardy repair by a dietetic and hygienic regimen similar to that for tuberculosis—forced feeding and fresh air in abundance.

The employment of the measures described above in acute abdominal operations has made possible twenty-two operations for appendicitis with spreading general peritonitis with but one death, and has reduced the mortality of operations for other acute abdominal conditions to 1.5 per cent in operations on the stomach; 2.1 per cent in operations on the gall-bladder and common duct; 18 per cent in operations for cancer of the rectum and colon.

Tungsten Rays.

BURROUGHS (*Lancet*, Oct. 29, 1921) states that the use of tungsten rays as a method of treatment is comparatively recent, and any additional facts as to their utility as a curative factor in medicine may therefore be of interest. The tungsten arc produces, besides light and heat rays, ultra-violet rays; these ultra-violet rays are beyond the limit of the visible spectrum, which ends at $\Delta = 3800$, and it has been found by experiment that when directly applied are strongly bactericidal between $\Delta = 3100$ and $\Delta = 2230$. Burroughs has been working for the past six months with an apparatus consisting of two electrodes of pure tungsten actuated by a current of 100 volts and 5 amperes, and the results have, on the whole, been most promising.

In all cases of superficial suppuration in which the author had tried it, a complete cure has resulted in about 8 to 12 treatments. Among these cases were the following: A poisoned and suppurating index-finger of two months' duration, entirely healed with six applications; an old varicose ulcer, healed in eight applications; a case of suppurating cervical glands of six months' standing with a large swollen inflammatory area extending from the horizontal ramus of the jaw to the clavicle, entirely cleared up with 14 applications; and a case of impetigo contagiosa on face and scalp of a child, aged two, cleared up in six applications. The same curative effects may be noticed in pustular discharges from the ear. Indeed, the tungsten ray has not only proved of great value in suppurative conditions, but also in cases of middle-ear deafness generally.

The ear treatment, which is applied by means of a specially made parabolic quartz-fluorite reflector, absorbing a portion of the ray, is of short duration, the earlier treatments lasting only 2½ minutes for each ear, if both are affected. That is to say, 1½ minutes' application is given through a suitable speculum to the tympanum, and one minute's application over the mastoid cells. The beam is made to focus on to the surface under treatment at a distance of 18 inches from the reflector. The patient's eyes must be protected with a shade of some kind, and the operator uses special leaded blue glasses. In cases of osteosclerosis a treatment as described above may be given every two or three days, the length of the exposure being increased to 2½ minutes for the internal application and 1½ minutes for the external. The improvement in the hearing is, as a rule, noticeable after the fifth treatment, but may appear earlier. In cases complicated by Eustachian catarrh or catarrh of the respiratory passages the fumes given off by the ray, inhaled through a suitable inhaler, are found to have a beneficial effect. A course of about 8 to 12 treatments is given, and the patient is asked to return in a fortnight in case any further treatment is required.

Rules for Massage.

BAINBRIDGE (*United States Naval Bulletin*, Vol. XV, No. 4, 1921) thus publishes the rules formulated by Captain W. H. Brood in charge of the massage and gymnast departments of the Alder-Hey Hospital, Liverpool. As a preliminary the masseuse must have a clear knowledge of the nature and extent of the abnormality to be treated and the methods by which recovery is to be obtained. Therefore the person entrusted with the rubbing should be present while the officer in charge goes over the patient, giving the history and examining the *x*-rays; also the nature and object of any operation that may have been performed should be understood.

Effective massage is impossible in the majority of cases without the use of a lubricant. The object of a lubricant is to make manipulation easy, to prevent chafing of the skin, or dragging of hairs. What lubricant is used is immaterial as long as this object is attained. The slightest chafing or bruising of the patient's skin during treatment is inexcusable and is evidence of faulty technique. Ordinarily French chalk or one of the talcum preparations is used, but where there is a considerable growth of

hair, trophic change, or an unusually dry skin, an oily material, such as olive oil or white vaselin, is indicated. The virtue of massage lies not in the lubricant but in the manual dexterity employed.

It is essential that a paralyzed limb should not be allowed to lie in a position in which the affected muscles are stretched, allowing the undisputed antagonism and possible contraction of the opposing healthy muscles. A normal, healthy muscle, even when at rest, is in a condition of slight contraction in order to respond instantly to an impulse. This condition of "tone" is absent in a paralyzed muscle. Paralyzed and weak muscles are kept from being stretched and elongated by a support applied to the affected limb. For example, a hyperextension wrist splint is worn in a case of musculospiral paralysis, a rectangular foot splint where the flexors of the ankle are weak, an abduction shoulder splint for a paralyzed deltoid muscle. The necessary massage can often be done in these cases without removing the supporting splint, but when its removal is essential the limb must instantly be passively supported by a pillow or sand-bag as the splint is withdrawn to prevent any stretching of the affected muscles.

Heavy tapotement, or percussion, movements should never be performed upon paralyzed or wasted muscles, as the attenuated muscles and weak nerves are easily injured. The gentlest petrissage, or muscle kneading, should be used, increasing in vigor as recovery proceeds.

Petrissage is best performed with the muscles or group of muscles in a relaxed and supported position. To illustrate this, when working upon the extensors of the forearm, the patient's wrist should be "dorsi-flexed," with hand and fingers supported on a sand-bag to secure relaxation of the muscles. In the case of the flexors of the forearm the hand must be "palmar-flexed" to secure similar relaxation. Relaxation of the quadriceps may be procured by placing a large pillow or sand-bag behind the knee. A similar pillow will also be found useful to secure semi-abduction or semiadduction of the various joints where muscular relaxation is required.

All passive movements should be performed by firmly grasping the limb just above and just below the joint. The necessary movements are made slowly, gradually, once only, and up to a point just short of giving pain.

Body weight will assist to immobilize the pelvis while the hip-joint is moved. Force is sometimes required to obtain additional movement of a joint, but should be used only when especially ordered by the officer in charge.

Any abnormal condition occurring in a joint, such as pain, heat, or swelling, should be immediately reported.

Bandages or splints which have been removed during massage should be carefully replaced in the same manner and position as worn before.

When massaging cases of fracture, bone grafting, or other condition producing callus, depletion movements should be employed to empty the main veins and lymphatic vessels, especially in that portion of the limb which is distal to the graft or fracture. Increased vascularization and consequently improved nutrition, essential to repair, will thus be promoted.

Encourage active rather than perform passive movements of the particular muscles upon which operations have been performed. Apply careful petrissage to the transplanted muscle and friction massage along the new course of the tendons to prevent adhesions. It is essential that these newly transplanted muscles and tendons should not be stretched until they are able to perform their new functions. Similar precautions must be taken in the handling of these cases as with paralyzed or weakened muscles.

Massage of these cases should be accompanied by moral and mental suasion. The patient should be encouraged to think hopefully of his recovery and be interested in his future possibilities. Try to convince him of the importance of making a real effort to use the functionally weak muscles,

and the serious results if he neglects to use them.

A course of massage is frequently ordered for cases before operation for bone grafting, tendon transplantations, or nerve suture in which there is old scar tissue near the site of operation. Moderately vigorous kneading should be applied to any fibrous thickening or scar tissue to liberate any latent infection which may possibly be lurking in it, which, if undiscovered before operation, would retard or prevent its success.

When making the weekly or fortnightly notes on the clinical progress of a case, vague generalities should be avoided, such as "patient seems better," or "arm improved," and the like. Incorporate in a sentence or two a tangible, clear, and concise statement bearing on the progress of the case in the direction of the main object of treatment. For example:

The girth of the thigh muscles has increased one inch.

The left quadriceps reacts well, with the exception of the vastus internus, which is lacking in tone and substance as compared with the right.

The extensors of the toes show faint voluntary contraction this day, June 1, 1917.

Cutaneous sensibility noted over whole dorsum of hand.

Fingers of the right hand are now of the same color and temperature as those of the left hand.

Active flexion at the elbow is obtained to an angle of 90 degrees, passive flexion to 100 degrees, etc.

In nerve cases the lesion may be partial or complete.

(A) Muscles: Note the complete (paralysis), or partial (paresis) absence of muscular activity, stating the particular muscle or groups of muscles affected.

(B) Skin: 1. Cutaneous sensibility. Note the areas of the loss of cutaneous sensibility. This is done with a camel's-hair brush or with cotton-wool. The patient's eyes should be closed or bandaged while the tests are made.

2. Trophic conditions. Note the condition of the skin, and state any trophic conditions, whether dull, shiny, or scaly, the presence of any trophic ulcers, etc.

3. Color and temperature. Describe the color and temperature as compared with the corresponding sound limb, and state whether ischemia or cyanosis is present.

4. Return of power and sensibility. After all nerve operations note the date of return of sensation to a previously insensitive portion of the skin, or return of voluntary power in a paralyzed muscle.

5. Electrical reactions. The electrical reactions in nerve cases are periodically examined. Inquire of the officer in charge the results of these examinations.

Treatment of Furunculosis in Infants.

LANGER *(Urologic and Cutaneous Review,* November, 1921) observes that furunculosis and impetigo contagiosa stand in remarkable contrast to one another in so far as their mode of spread is concerned. While impetigo is exceedingly easily transferable, so that group-infections are very common occurrences, furunculosis generally attacks separate individuals, and only under special circumstances is it possible to establish a transfer. Furunculosis is the skin disease particularly in which the spread is influenced in the first place by endogenic factors, to wit, by the degree of resistance of the individual. The increase of the disease during the war afforded clear proof of this; for both at the front and at home it was not those who were exposed to specially unfavorable hygienic conditions who were affected, so much as those who were weakened by strenuous exertion, undernourishment, or disease. That generalized furunculosis is usually apt to follow after a solitary furuncle is further proof of the significance of individual resistance.

Now since in comparison with furunculosis in adults the disease is more apt to be generalized in infants in whom numerous furuncles appear scattered over the entire body, this is an indication that the condi-

tions of resistance at the age of infancy are considerably more unfavorable than in adult years. The therapy must take this into consideration, too, and in addition to the agents used in the local treatment, further therapeutic measures which have for their aim the elevation of the resisting power must enter into the treatment.

As a fact, furunculosis in young infants is found in connection with diseases which are associated with a dyscrasia of the whole metabolism. The affiliation secondarily of furunculosis with the atrophies of artificially nourished children, with lues congenita, or with constitutional diseases, is a very common occurrence.

Two forms may be distinguished: The form called pustulosis, in which the superficial pustules are located in the flabby skin of sick nurslings, preferably on places subject to maceration, a condition to be distinguished from the real, multiple abscesses of the skin which proceed from the deeper glandular layers extending deeply into the subcutaneous connective tissue. While furunculosis of adults consists of a circumscribed inflammation of the cellular tissue which the skin, closely united with the substratum, prevents from spreading out, in infants on the contrary the tendency to extension is plainly marked. The loose subcutis opposes no impediment to infection in many places. This applies very particularly to the scalp. In the shortest time a furuncle of the head may undermine large areas under the skin of the head with phlegmonous inflammation. But such phlegmonous inflammations may result on other parts of the body also, and they may be combined with deep necrotic processes. Large defects and deep scars are the consequences of suppurations of this kind even if general blood infection or metastatic abscesses do not make the picture still darker.

While always in the treatment of adults the purely conservative methods are to be employed, furunculosis of infants, owing to its peculiarities, demands an alteration in the line of therapeutic measures. It is to be advised most urgently in all cases to open the abscesses at once. It is best to use small pointed knives for the purpose, with which the opening is merely pricked; under no circumstances cut deeply. A careful daily inspection is indispensable for noting the proper time for the incision of the abscesses which form. Special care should be devoted to the furuncles in places which, according to experience, have a strong tendency to phlegmonous inflammation, viz.: the buttocks, back, the loose tissue of the back of the hands and feet, and particularly the scalp. Small furuncles are particularly apt to be overlooked on the head, until suddenly a quickly developing, wide-spread collateral edema surprises us. The fluctuating pus focus will usually be discovered without difficulty. Incision and evacuation causes disappearances in the shortest time. But the abscesses only should be incised, and incision of the edema absolutely avoided.

Sudden rise of temperature should arouse suspicion of phlegmonous involvement. In these cases immediate incision is demanded. Broad cuts must be avoided, small incisions which bring about the emptying of the pus suffice; a loose tampon takes care of the drainage until healing takes place.

Surgical treatment carefully followed helps to prevent the phlegmonous complications, but it is not capable of curing the disease nor of shortening its course. The spread of the infectious organisms to the healthy skin is to be guarded against by surrounding the affected areas with protective dressings. For this reason careful cleansing of the body must be striven for. Daily cleansing baths are to be strictly adhered to. In the form of infantile pyodermia designated as pustulosis, in which the body is covered with numberless fine vesicles, the action of an alcoholic solution is really astonishing. As a rule the pustules disappear entirely within twenty-four hours after one or two applications.

All local measures of treatment, however, remain as dull weapons when not combined with other measures which have for their purpose the raising of the general

resistance. Measures for improving nutrition come in first for consideration. Any disturbance of nutrition must be energetically combated. No direct influence upon increasing the resistance can be attributed to artificial nutrition. But if human milk can be had it should unquestionably be used. In severe cases, particularly in young nurslings, it acts directly as a life-saver. Furunculosis, if regarded as a disease depending upon the loss of the immunity of the skin, is an instructive demonstration of the power of human milk to increase the resistance.

Specific vaccine therapy is finding an ever-increasing recognition in the treatment of furunculosis in adults. Vaccine therapy has also been applied to furunculosis in infants, and the impression gained here is also that the course of the furunculosis is favorably influenced. But theoretical consideration of the possible effects of such a line of treatment encounters difficulty; for the presupposition of its action rests of course upon the capacity of the patient to become immunized. Now we know that the capacity for active immunity in infants differs from that in adults. It is known from trustworthy experimental investigation that the power of producing antibodies, *i. e.*, specific protective bodies, is lacking in new-born children. Opinions differ as to how the conditions change in the course of early infant life. But this much is settled, that during the first period, about four months, the formation of active immune bodies is slow and untrustworthy. Clinical observations corroborate the experimental results, for it is well known that the nursling stage shows itself to have much weaker resistance to infection than the later periods of life.

In recommending vaccine therapy for infants, the question must be considered whether the recommendation is based upon a well-founded indication. In children during the first four months, even with intensive vaccination, it was impossible to detect any antibodies in the blood.

It is sufficiently well known that numerous infections are surprisingly well influenced by the injection of the smallest amounts of albuminous substances. These reactions are grouped together under the name of protein therapy or irritation therapy, and it is highly probable that vaccine therapy in infants is merely to be regarded as protein therapy.

The consequences of an explanation such as this lead to another conception of vaccine treatment. All our ideas in regard to the mechanism of specific immunization in this special case must be abandoned. The matter of autogenous vaccine or stock vaccine is of no consequence. We make use of a protein body, and if we adhere to a staphylococcus suspension, we do so because we have in this way a fixed concentration and a uniform protein suspension at our disposal. An additional reason is the fact that at about the sixth month of life, and earlier in some cases, the capacity of active immunity begins. It is subject at all events to great individual variation. The exclusive use of staphylococcus vaccine at any rate makes it possible to take advantage of this capacity at the right time, and to combine the non-specific and specific action. Just so long, however, during the first months when only the unspecific action is to be taken into account, the bases for the calculation of dosage and the interval between doses must be changed. The intervals used in active immunization are not applicable and lead only to loss of time. The quantity of bacteria taken must be very much larger. It is in harmony with the lack of immunity that infants stand much larger amounts of bacteria without reaction than adults. It is never possible to produce fever in nurslings by injection of vaccine, consequently it is justifiable and even demanded to take amounts of bacteria which are not too small. These considerations have led us as a matter of principle to give the injections daily in infantile furunculosis, and to inject uniformly a larger number of bacteria, about 500 to 1000 million. The results which we have seen from this have justified our practice.

Reviews

ARTERIOSCLEROSIS. By Louis Faugères Bishop, M.A., M.D. Oxford University Press, New York and London, 1921. Price $4.25.

The Preface of this volume shows that the first printing of the present edition was in March, 1914. Since then there has been a second impression in February, 1915, and apparently this is the third impression in October, 1921.

The design of the book is to discuss degenerative changes in the blood-vessels and the results thereof, with a consideration of the provoking causes of such changes and with the secondary effects which they induce upon the cardiac mechanism. The illustrations, which are not numerous, do not include electrocardiographic tracings, but polygraphic tracings. Some of them deal with pathological conditions in the heart and blood-vessels.

The book is printed in large type and covers a little less than 400 pages. Adequate consideration is given to the influence of dietetics in the prevention and relief of these cases, and occasionally the history of a patient is cited to illustrate in a condensed way the meaning which the author desires to convey. There is quite a long chapter, partly made up of communications by physicians attached to life insurance companies, dealing with the relationship between arteriosclerosis and life insurance.

THE CLINICAL STUDY OF THE EARLY SYMPTOMS AND TREATMENT OF CIRCULATORY DISEASE IN GENERAL PRACTICE. By R. M. Wilson, M.D., C.H.B. Oxford University Press, New York and London, 1921. Price $4.75.

The author of this book has been fortunate in two respects, namely, that for a time he was assistant to that great pioneer, Sir James Mackenzie, and secondly, that he has been able to obtain a "foreword" for his volume by that eminent investigator, who in his foreword once more emphasizes the obstacles to the progress of medicine because of the lack of understanding of how the investigations of disease should be undertaken.

The special object of the author has been to study some of the prominent symptoms of early cardiovascular disease, about which he thinks our knowledge heretofore has been imperfect, although a great mass of observation has accumulated. There are twenty-one chapters in the book which deal with the physiology and pathology of the heart, such as exhaustion and cardiac embarrassment and their determining causes; the pulse rate as a symptom, with pulse tests and cardiac efficiency. Later on the chapters deal with the types of infection which affect the heart, the sensation of cardiac pain, with observations on blood-pressure, upon the earliest symptoms of heart failure, and last of all, a chapter on treatment founded on early signs and symptoms. Concerning the interesting subject of extrasystoles, which Muller thought were always an evidence of cardiac trouble, Wilson finds himself entirely in accord with Sir James Mackenzie in the view that they have not, in the absence of any other symptoms, any serious significance. He says: "I have never known of a case with extrasystoles, with no other signs than this, that has come to hurt by pursuing the normal course of life." On the other hand, he believes that extrasystoles occur in response to certain toxic agents, and that when there are evidences of cardiac failure they may possess very grave meaning. So far as use of drugs for their control is concerned, he finds very large doses of atropine are more successful than anything else, as much as 1/30 of a grain being given subcutaneously. The difficulty is that such a dose produces so many disagreeable symptoms in addition to abolishing the extrasystoles that many patients will not tolerate it. In some instances extrasystoles are undoubtedly not due to any toxic condition, but arise from a mechanical disturbance in the abdomen, and consequently the latter type is most frequently met with after the ingestion of a heavy meal.

THE OXFORD MEDICAL PUBLICATIONS. The Anatomy of the Human Orbit and Accessory Organs of Vision. By S. Ernest Whitnall, M.D., B.C.H. (London). Illustrated largely by Photographs of Actual Dissection. The Oxford University Press, New York and London, 1921.

This book, the outcome of lectures given to candidates for the Oxford Diploma in Ophthalmology, is admirable in every respect, and a most welcome addition to ophthalmic literature. Of great value are the illustrations, many of them photographic. Dr. Whitnall's skill in description is noteworthy.

The book is composed of four parts: The first concerns itself with the bony formation of the orbit, its relations, and the paranasal sinuses; the second, with the eyelids, conjunctiva, and lacrimal apparatus; the third, with the globe, ocular muscles, blood-vessels, and nerves; and the fourth, with the cerebral connections of the nerves. An excellent bibliography and an index conclude the volume.

This work should make an appeal, not only to the ophthalmologist, but also to the rhinologist and the neurologic surgeon. Within its covers is portrayed information of real value to each of them.

G. E. DE S.

THE CARE OF EYE CASES. A Manual for the Nurse, Practitioner, and Student. By Robert Henry Elliott, M.D., B.S., F.R.C.S. With 135 illustrations. The Oxford University Press, New York and London, 1921.

Colonel Elliott, impressed with the fact that the student receives comparatively little instruction in the practical care of the eyes, when, to quote a sentence from the preface, "he comes to deal with cases in the sick-room on his own responsibility," has so dealt with the subject-matter of the book that nurse, practitioner and student may profit. The volume is arranged in three parts, the first including, after a brief description of the anatomy of the eye, a discussion of asepsis in ophthalmic surgery, remedial agents, preparation for an eye operation, and directions for the care of the patient after operation. There is also a section on special methods of ophthalmic diagnosis, for example, field testing, ophthalmometry, tonometry, etc. In part second the usual diseases of the eye and errors of refraction and disturbances of ocular motility are recorded, the descriptions being greatly condensed and elementary. The book concludes with a list of operations and the instruments required for each operative procedure. Col. Elliott's large experience in all branches of ophthalmology lends weight to his many practical directions, and the book should be of use to those for whom it has been written.

G. E. DE S.

HYGIENE OF WOMEN AND CHILDREN. By Janet E. Lane-Claypon, M.D., D.Sc. Oxford University Press, New York and London, 1921. Price $5.

This is a book of 354 pages including the index, designed, as its title indicates, to deal with the hygiene of women and children. The authoress is Lecturer on Hygiene in the Household and Social Science Department of King's College for Women. She is also a justice of the peace, and was formerly medical inspector under the local Government Board. Her thought has been in the preparation of this book that while there has been a great expansion on the whole subject of hygiene during the last half-century, a special volume dealing with the hygiene of childhood and womanhood is at the present time necessary. In other words, while the book recognizes the value of general hygienic measures undertaken by local or general Government Boards concerning the whole population, there is a wide field for individual hygiene. The book, of course, is intended chiefly for nurses and health teachers, but the author hopes that she will be able to interest others who have more or less interest in this subject for various reasons.

Altogether she has divided her text into 27 chapters, dealing with the home, the garden, the storage of food, ventilation, general and personal cleanliness, clothing, care of the feet, exercise, fatigue, rest and sleep, beverages, food and feeding, milk as a food, the feeding of children in infancy and early

life, with a concluding chapter upon growth factors in infancy and childhood.

There are 71 illustrations dealing with hygienic living, garments, weight curves, etc. In her chapter on beverages, while fully recognizing the evil results which attend the excessive use of alcoholic drinks, the author well says that the question to be considered is whether small doses of alcohol are detrimental, such as would be taken by those persons who, while never taking excessive amounts, habitually take some quantity of alcohol each day. She discusses this subject in considerable detail and concludes that its constant daily use is deleterious. She makes, however, this important statement, which all who are familiar with the subject will agree, namely, that if there is already a sufficient dietary of other substances, alcohol does not act as a food, the tissues having enough fuel without alcohol, but if for any reason there is an insufficient food supply, then alcohol is useful in small amounts as a food; in other words, the employment of alcohol in conditions of disease or old age where the normal quantity of food cannot be taken and assimilated is recognized as being of distinct value.

Bowel Diseases in the Tropics. By Sir Leonard Rodgers, M.D., F.R.C.P., F.R.C.S., F.R.S. The Oxford University Press, New York and London, 1921. Price $9.

As may be imagined from the title, Sir Leonard's book deals with Cholera, Dysentery, Liver Abscess, and Sprue. As Professor of Pathology in India and physician to the cholera and dysentery wards of the Calcutta Medical College Hospital, it is needless to say that he has had so large an experience that his views are worthy of careful consideration. He points out in the preface that the war greatly increased the demand for his books upon Cholera and Dysentery, but during the same period much additional information has been accumulated concerning these conditions, and, therefore, extensive rewriting and revision of his earlier text has been essential, with special reference to etiology and treatment. Heretofore he dealt with cholera and dysentery in one volume and with liver abscess and sprue in another. All of these subjects are now included under one cover.

There are few men who have done so much to increase our knowledge in regard to our treatment of tropical diseases as has the author of this book, and there are few who can claim to be not only competent pathologists but also active hospital clinicians. The combination makes a book which is exceedingly satisfactory to the general practitioner.

The book is illustrated with a number of plates, colored and in black and white, with charts and diagrams which are appropriate.

Neoplastic Diseases. A Treatise on Tumors. By James Ewing, A.M., M.D., Sc.D.; 2d edition, revised and enlarged. W. B. Saunders Company, Philadelphia, 1922. Price $12.

The present edition of Dr. Ewing's excellent book contains no less than 517 illustrations, and it is an evidence of appreciation of good work that a second edition should have been called for within three years after the first one appeared. The object of the work, as some of our readers may know, is to present within reasonable space and in accessible form the main features of the origin, structure, and natural history of tumors. Until recently it has been the prevailing impression that tumors fell into a limited number of grand classes, of which the forms occurring in the several organs are so nearly related as to be virtually identical. The author believes that this point of view has greatly retarded the progress of our knowledge of morbid growths. He actively combats this point of view, and, as he well says, to illustrate his meaning, no one would think of confusing lobar pneumonia with pneumonic plague, although both are examples of exudative pneumonitis.

The present edition contains nearly 1100 pages, and, therefore, it is evident that there must be an illustration on almost every other page. Some of these illustrations are macroscopic and others micro-

scopic, the majority of the latter type, as would naturally be the case.

Dr. Ewing has the happy faculty of writing clearly and to the point. While he is thorough in his description of his subjects, he at no time is diffuse and difficult to follow. The book will find its greatest popularity with teachers and students of pathology, with surgeons, and with those physicians who desire to keep themselves abreast with up-to-date knowledge in connection with this important subject.

A Treatise on Hygiene and Public Health. With Special Reference to the Tropics. By Birendra Nath Ghosh, F.R.C.P., F.R.C.S. (Glasgow), and Jahar Lal Das, D.P.H., Calcutta, with an introduction by Kenneth Macleod; 4th edition. Hilton & Co., Calcutta. 1921. Rs. 6 or 9/6 shillings net.

The first edition of this book appeared in 1912. As its title indicates, it deals chiefly with hygiene and public health in tropical areas. It is illustrated with 63 pictures, all of them dealing with apparatus used by public health officers, or which are to be installed in houses or institutions under their direction. There are other illustrations of various types of parasites.

As Colonel Macleod says in his Foreword, the merit of a treatise on hygiene depends on the clearness and accuracy with which it sets forth in plain and simple language the facts and doctrines bearing on causation and prevention of disease which have accumulated in recent years and the most easy and effective manner of their practical application. We think it may be fairly said that the Indian authors of this volume have fulfilled the task which Colonel Macleod points out is essential.

Infant Feeding. By Clifford Grulee, A.M., M.D.; 4th edition. W. B. Saunders Company, Philadelphia, 1922. Price $4.50.

The earlier editions of Dr. Grulee's book have been received with favor both in these pages and by the profession in general. Originally based upon a course of lectures given to students of Rush Medical College, it has gradually developed into an excellent manual for the pediatrist and the general practitioner. Diet is not only considered from the nutritional aspect, but also from the aspect of the various diseases from which young children frequently suffer. The book closes with a chapter upon the "Psychology of Infant Feeding," which is a novelty of no little importance.

Lessons on Tuberculosis and Consumption for the Household. By Charles E. Atkinson, M.D. Illustrated. Funk & Wagnalls Company, New York, 1922. Price $2.50.

We think that the average physician can get a fairly clear conception of the trend of these pages from the announcement made by the publishers concerning it; to wit, that "Into this stimulating and cheering volume is poured a rich treasure-trove of health-restoring, health-guarding instructions . . . destined to carry its messages of hope to those multitudes, optimistic or discouraged, who seek to ward off or recover from tuberculosis and consumption."

It is dedicated "To the Sufferer and to the Seeker of Prevention," and finally the publishers tell us that this book should be in every home and "given the place of confidence and trust (we might almost say reverence) which it so richly deserves."

The titles of some of the chapters are as follows: "If the Chest Had a Window," "You and Your Physician," "The Elixir of Health, Fresh Air," "When Blue Days Come."

Medical Electricity for Students. By A. R. I. Browne. Oxford University Press, New York and London, 1921.

This book is primarily intended for the use of students preparing for the examination in medical electricity of the chartered "Society of Massage and Medical Gymnastics." The student is recommended to study the theory of high-frequency currents and their application from books dealing exclusively with these matters. The same advice is given in regard to *x*-ray work. The author does not describe various types of electrical apparatus. The one type which seems best to the author is given rather than multiple types.

There are 20 chapters dealing with the

principles of electricity, various forms of cells and batteries, the subject of induction, interrupters, and then, in connection with electrotherapy, chapters devoted to the effects of electricity on the body, ionic medication, methods used in testing muscles and nerves, electric baths, static and high-frequency and diathermic treatment, and last of all, a chapter, which is less than 20 pages, of the summary of the treatments which may be instituted in various disorders. The book contains 82 illustrations.

THE QUIMBY MSS. Edited by Horatio W. Dresser. Thomas Y. Crowle Company, New York, 1921. Price $3.

The subtitle of this book states that the MSS. therein discussed are valuable as showing the discovery of spiritual healing and the origin of Christian Science. It will be recalled that Mary Baker Eddy, before propounding the doctrine of Christian Science, as an invalid went to a so-called healer, Quimby, who did not use drugs, but he produced his results by a system of mental and spiritual effort or theory. These various documents or letters describing his methods are contained in this volume. Doubtless at some time in the future they will possess the same historic value as those possess which deal with Perkins's tractors or other vogues which come and go.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY. By W. A. Newman Dorland, A.M., M.D.; 11th edition, revised and enlarged. W. B. Saunders Company, Philadelphia, 1922. Price $7.

When we consider that Dorland's Dictionary appeared at a time when there were other excellent dictionaries on the market and that it has reached its eleventh edition in twenty-one years in addition to being revised and reprinted on a number of occasions, it is at once evident that it must have met a real professional need. It is now two years since the tenth edition appeared, and, as the author says, there has been no let up in the coinage of new terms in biology, chemistry, endocrinology, immunology, and neurology. Furthermore, new terms have not been limited to these topics, but may be found in almost every branch of medical knowledge.

The book, as heretofore, is printed on thin paper, which is of sufficient quality to prevent the register of the opposite page from showing. It has a flexible binding which makes it easily handled, and which in previous editions has proved to wear very well. Because of the use of thin but tough paper, more than 1200 pages make a remarkably small bulk, and the amount of information which is given, sometimes in detail, is remarkable.

The book is one which we constantly find useful, and can be cordially recommended to those who are seeking an excellent medical dictionary.

CLINICAL EXAMINATION OF THE NERVOUS SYSTEM. By G. H. Monrad-Krohn, M.D., M.R.C.P., M.R.C.S. With a foreword by T. Grainger Stewart, M.D., F.R.C.P. Paul B. Hoeber, New York, 1922. Price $2.

As Dr. Stewart points out, in his foreword to this little volume of less than 150 pages, all who have had experience in neurological work realize how essential it is to have a routine method of examination of the nervous system. By following such a method time is saved, mistakes are avoided, and points requiring further investigation are brought out clearly. He also points out that it is impossible to divorce the physical from the psychical or the psychical from the physical in neurological practice. In all probability the book will prove more useful to the general practitioner for whom it is specially designed than for the specialist in neurology who has doubtless developed his own routine methods of examination.

The book includes not only methods of direct physical examination, but also electrical methods for determining reactions, and has twelve diagrams which are excellent, original in some instances, and all of them interesting. Possibly that indicating sensory segmentation in the human being is the most novel.

Notes and Queries

The Railroad Labor Situation.

The railroad labor situation would be ludicrous if it were not so serious. The rates fixed by the Labor Board for common labor are so far above those prevailing outside of the railroad service that the companies are finding it practical to contract out much of their work and save 20 to 30 per cent, which of course is after the contractors make a profit. The Erie has contracted for track maintenance over its entire line. The St. Louis and San Francisco substituted heavier rails over much of its line last year; if it had had the work done by its own employees it calculates that the cost of the labor would have been $550 per mile, but it was done by contract at $350 per mile. Pumps on the Frisco road are operated by electricity, and require only that a switch be thrown to start or stop, and an occasional oiling of the parts. Under the union-made rules that have been in force this meant three shifts on a pump, but the company has been able to contract for the service at a saving of about 65 per cent.

It would seem to be time that the public waked up to the fact that the cost of operating the railroads is not wholly a matter between the companies and the employees but of general concern. Occasionally a man who has this opinion makes himself heard. We have a letter from W. H. Harris, a grower of pecans and peaches at Fort Valley, Georgia; he sets out his views in effective language as follows:

It seems the unanimous opinion of the farmers, the actual farmers who produce crops, that only one thing is needed—to be *permitted* to sell a crop for more than it costs to make it and haul it to market.

Lending a farmer money to make a crop out of which he doesn't get cost does not benefit him. It merely postpones bankruptcy. There can be no recovery until crops sell at a profit.

There can be no profit so long as a law-made agency takes the major part of the farmer's crop, representing his year's labor, and turns it over to the organized workers for their few days' work hauling it to market. That is the crux of the situation.

The farmer wants no special legislation, no representation on the Reserve Board, no preferred jobs; he merely wants the special legislation favoring other workers removed—in other words, that every tub stand on its own bottom, and let each man earn what he can.

Nothing will save the farming industry but a deep cut in freight rates. We are all merely producing tonnage for the railroads, who merely collect from the unorganized workers, and turn it over to the organized workers. The latter punish when the politicians fail to do their bidding; we farmers don't.

When the Chicago labor board fixes a railroad man's pay at a higher price than he can earn in other open pursuits, it is no largess of the labor board. It is a purely arithemetical proposition. The excess given to the railroad worker is taken from what the farm worker earns.

The impractical humanitarian will say that the higher pay given the railroad laborer will put up to a "living wage" the pay of the laborer in other pursuits, but the reverse is true, for the more paid to the railroad labor, the less of the price there is left to pay the other labor.—*Bulletin National City Bank*, February, 1922.